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### An Address.<sup>1</sup>

#### NATIONAL HEALTH INSURANCE.

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President of the New South Wales Branch of the  
British Medical Association.

FIRST of all I wish to thank you for the honour that you have conferred on me in electing me your President, an honour that is not accepted lightly, but in full realization of the responsibilities that are attached to the office. I need hardly say that I shall endeavour to carry out these duties in a manner befitting the standard set by my predecessors. Each of them with his own particular

gifts has filled the chair with distinction to himself and with benefit to our Association. As a general practitioner, I realize the difficulties of succeeding in following worthily in their footsteps, but at the same time I feel that it is highly desirable that representatives of the rank and file of the profession should, even though it may mean a personal sacrifice, take an active interest in the affairs of the Association and even fill some of the executive offices.

The subject that I have chosen is one that very much concerns every member of the profession, whether he be general practitioner or specialist (if, as we think, specialist service should be included). National health insurance has occupied the attention of the Council of the Branch and of the Federal Council very much in the last few years, and consequently it was thought advisable to send our Secretary, Dr. John Hunter, to England to study this important project at first hand. That this was a

<sup>1</sup> Delivered at the annual meeting of the New South Wales Branch of the British Medical Association on March 13, 1937.

wise course of action has been shown by his grasp of the situation, as was revealed in a recent address to the Council. I have to acknowledge his help in the preparation of this address.

National health insurance is very much in the minds of the political powers, as has been shown by recent references in Parliament and also by the visit last year of Sir Walter Kinnear to advise the Federal Government on the financial side of the question. It is accordingly very necessary for us to have a thorough knowledge of the question and to be able to offer constructive criticism of any act of Parliament that may be brought forward, and so not be taken unawares, as was the profession when Mr. Lloyd George introduced the scheme in England in 1911. We must also remember that many of the important provisions of the working of this act were introduced at the insistence of the profession once it settled down to the realization of the effect of this measure and the difficulties of its administration.

It is a commonplace that science has transformed the world; this applies in a marked degree to the medical art. But these advances in medical science and technique have resulted in an increase of the cost of medical service. The service, though much more valuable, makes payment of the cost more and more difficult to the bulk of the population, and so one feels that some assistance must be given. National health insurance will do this and still preserve to the public the personal service that characterizes the general practitioner type of practice. This should check the drift to the public hospitals, which must end in a form of nationalization of the medical services, such as is foreshadowed in the recent legislation in Queensland. People now are health-minded and rightly demand an adequate service, but the question of cost is the difficulty, especially in the case of the bulk of wage-earners. An attempt has been made in the past to meet this need by the friendly societies—a strong voluntary organization which is of use only to those who enjoy a reasonably good standard of health. The remainder of the population—the unemployed, the unfit and the careless—has to be attended to. At present these people go to the hospital out-patient departments, if they can walk; if not, or if they are too lazy, they fall back on the charity of the profession, a charity which some organizations now want to take as a right.

In this aspect the following figures are interesting. The last census returns of the Commonwealth (1933) show that there were in New South Wales 130,484 persons in receipt of income over £260 *per annum*, 962,824 with income below £260, and 1,491,063 people with no income (this, of course, includes dependants and children). The friendly society membership is 204,626, so it is evident that they care for the needs of only a small proportion of those who would come under a national health scheme. We must recognize the social work that the friendly societies have carried out, and realize

that they must receive consideration when any form of health insurance is introduced.

It is now generally accepted that voluntary health insurance cannot reach the masses and that compulsory insurance is necessary. Germany was the first nation to introduce it, and now it has spread to most of the countries of Europe and has been joined up to other forms of social insurance—old age, invalid and unemployment—all necessary adjuncts of the modern scheme of social service.

#### Main Features of Health Insurance.

I now propose to deal briefly with the main features of health insurance. These are: (i) to make available medical services to people who are not in a position to provide adequately for private medical care; (ii) by giving early and effective treatment, to restore people to health and work as soon as possible; (iii) to prevent disease.

Those covered are usually people with an income below a set figure; this includes the bulk of employees in industry of all kinds. This may or may not include dependants, as is the case in Germany, but not in England.

Contributions are usually made by employer, employee and the State—by the last-mentioned to a varying degree. The contribution may alter with the basic wage, but in England it is a flat rate. The benefits commonly provided are: (i) Cash benefit—a percentage of the basic wage or a flat rate, as in England. There is usually a waiting period, generally three days, and a limit of six months. (ii) Medical benefits are provided in all schemes except that of the Irish Free State. The range of treatment varies from general practitioner service in England, to complete service in Germany. (iii) Maternity benefit. (iv) Disablement benefit—a cash benefit for permanent disablement. (v) Death benefit.

These are statutory benefits. In addition, other services, for example dental or consultative, may be given to the members by insurance carriers, that is, approved societies, when they have at their disposal sufficient surplus funds. The tendency is in England to add further benefits as time goes on so as to make the range of service as complete as possible.

#### The Principles of Health Insurance.

One cannot do better than quote the principles of national insurance as enunciated by the Committee of Economic Security at Washington in 1935.

1. The fundamental goals of health insurance are: (a) provision of adequate health and medical service to the insured population and their family; (b) the development of a system whereby people are enabled to budget the cost of wage loss and medical costs; (c) the assurance of an adequate remuneration to medical practitioner and institution; (d) the development of new incentives for the improvement in quality of medical service.

2. In the administration of the services the medical profession should be accorded responsibility for the control of professional personnel and the procedure for the maintenance and improvement of the quality of service; practitioners should have broad freedom to engage in insurance practice, to accept or reject patients, and to choose the

procedure of remuneration for their services; insured persons should have freedom to choose their physician and institution, and the insurance plan should recognize the continuance of the private practice of medicine and the allied professions.

3. Health insurance should exclude commercial and other intermediary agents between the insured population and the professional agencies which serve them.

We shall see how these are evidently set out as the result of inquiries principally in the working of the British system.

#### General Plan of Administration in England.

When national insurance was introduced in England in 1912, approximately one-third of the working class was enrolled in friendly societies and benefit organizations connected with works, trades unions and insurance societies. These associations were not interfered with, but were, when approved by the Government, known as approved societies. The conditions of approval were: (i) that they were not operated for profit, (ii) that they left the complete control of their affairs in the hands of the insured members.

Under the control of the Minister for Health they enrol members and administer statutory cash benefits and such additional benefits as the financial position of the societies allows them to give. They do not administer the medical benefits, which are administered by local insurance committees. This is very important.

A majority of the members of the local committees are elected representatives of insured persons. The remainder include local nominees of the medical profession, the local county council and the Minister for Health. One of the county council representatives must be a medical practitioner, and unless the committee numbers less than twenty-five, one of the Minister's representatives must also be a doctor. The panel committee (one for every insurance committee area) is elected by local insurance practitioners—all are medical members. There is also a pharmaceutical committee, similarly constituted, in each area. These two committees are statutory bodies and are independent of the insurance committee, acting in local negotiations and adjudications. The separation of function between approved societies and insurance committees was not part of the original plan of Mr. Lloyd George, but was the result of the demand of the medical profession that the medical benefits should not be directly administered by the approved societies.

Finally, there is a central administrative body, the Ministry of Health, which operates the regional medical staff. The services of members of this staff are of the highest importance in the supervision of both cash and medical benefits. They are whole-time salaried officers who have had considerable experience in general practice. They act in all matters of dispute; they visit all practitioners and inspect the records which are required to be kept concerning insurance patients. They also keep records for the Minister's department, and inquire

into cases of over-prescribing and various matters concerning medical benefits. England has been fortunate in the men undertaking this duty, and to a large degree the smooth working of the system is due to their efficiency and tact.

#### Payment of Medical Officers.

Medical officers may be paid in any of the following ways: (i) by fixed salary for whole or part-time service; (ii) by capitation, that is, by a *per caput* allowance for each insured person; (iii) by prescribed fees for an illness or case; (iv) for work done, that is, by fees usually on a reduced scale for each service; (v) by reimbursement, the insured person receiving payment according to a scale, and he in turn paying his medical account.

In England medical benefit is administered by local insurance committees. The insurance practitioners receive their remuneration from these committees, not from the approved societies. They have no direct relations with the approved societies. There is wide latitude to the physicians in their choice of the above methods of remuneration. It is highly significant that the capitation basis has been the choice of most areas. It involves much less "red tape" and book-keeping than other methods do, and operates very equitably amongst the insurance doctors—the amount is nine shillings *per annum*. A practitioner, working alone, may not accept more than 2,500 insured persons (remember that in England dependants are not included); but if he employs a permanent assistant, he may accept up to four thousand. The service rendered is set out in the medical benefit regulations:

The treatment which a practitioner is required to give to his patient, comprises all proper and necessary medical services other than those involving the application of special skill and experience of a degree or kind which general practitioners as a class cannot reasonably be expected to possess.

Confinements are not included in the service provided.

A practitioner is committing a breach of the regulations if he accepts a fee for any service within the range of the practitioner's obligation. If he proposes to charge a fee for a service that he regards as outside his obligation, he must give particulars to the insurance committee, which then refers it to the panel committee. The opinion of the panel committee is then handed on to the Minister by the insurance committee along with its own opinion. If the two differ, the Minister refers the matter to a tribunal of three, two of whom are medical practitioners. The practitioner's action is thus determined by his own colleagues.

Medicines may or may not be supplied by the practitioner. Usually this varies with the accessibility of pharmaceutical services. A fee of two shillings and threepence per person *per annum* is allowed in England.

#### Extension of the Scheme to Adolescents.

It is now proposed that medical benefits should be extended to employed persons from fourteen to

sixteen years, but this is not to include sickness benefits. From the practitioners' point of view the service will be the same, except that certificates for national health purposes will not be required. The Minister for Health suggested accordingly that six shillings (instead of the usual nine shillings) should be the capitation fee, taking the view (so far not substantiated) that these persons will require less medical service and that certification will not be necessary. The profession maintains that certificates for employers will still be required and that there is no proof that the medical attention will be less than for the rest of the average population. A compromise has been suggested by way of a fee of seven shillings and sixpence, but this is still the subject of negotiation.

#### *Extension of Scheme to Dependants.*

Of late years the British Medical Association has been active in promoting the formation of public medical services for the dependants of insured persons. These services are organized and controlled by the members of the medical profession themselves. For a small weekly payment these dependants receive a general practitioner type of service, similar to that provided under the *National Health Insurance Act*. The premium varies according to (a) the income, (b) the number of dependants, that is, with an income of £250 to £275 *per annum*, and three in the family, the premium would be £3 10s. *per annum*, payable in weekly instalments. A large number of dependants of insured persons now avail themselves of these services, which have no connexion with the Ministry of Health. This should be well worth considering as an adjunct to national health insurance.

#### *The Present Position in England.*

The present position in England is that medical care is provided to some sixteen and a half million persons in England and Wales, and to nearly two millions in Scotland; and the privilege of engaging in insurance practice is enjoyed by every licensed medical practitioner. The range of medical service which comes under the guarantee was left vague and is now administered without friction, especially because the medical regulations established by the Ministry of Health are developed in close cooperation with the medical profession.

Each year there arise a few situations which are not easily solved; these are dealt with first by the local authorities (the insurance committee and the local medical committee, which is really the panel committee). The two main difficulties are: (i) over-prescribing, (ii) over-certification.

Prescriptions are priced and sent to each practitioner by the local insurance committee, when it is suggested that over-prescribing occurs, and the matter is considered by the practitioner and the regional medical officer. If the suggestion recurs, the complaint is sent on to the local medical committee; and if any grievance is felt with its judgement, the practitioner can appeal to a tribunal set

up by the Minister for Health. Two of the three members of this tribunal must be medical practitioners. If the decision is against the practitioner, the Minister may withhold a portion of the practitioner's remuneration. This does not occur very often.

Over-certification is regulated by the regional medical officers; of these, there are some eighty who have had extensive experience as general practitioners. The approved society may arrange for a consultation with the regional medical officer and practitioner when it doubts the diagnosis or the duration of incapacity. The practitioner may also ask for a consultation with the regional medical officer. To protect the medical practitioner, a patient dissatisfied with certification may transfer from his list only at the end of a quarter, and after giving one month's notice, unless both doctors concerned in the transfer consent to this transfer.

#### *Summary.*

In no instance where national health insurance has been introduced has there ever been any discussion or suggestion of its abolition. It is true that certain difficulties arose in the early days in England, and the Association, by united action, contended for six main points, which were ultimately granted. These were: (i) income limit for those eligible for benefits; (ii) free choice of doctor by patient, and patient by doctor; (iii) medical benefits to be administered by insurance committees and not by approved societies; (iv) method of remuneration to be decided by the profession locally; (v) the amount of remuneration; (vi) representation of the profession on various administrative bodies.

Reviewing the experiences of the profession in England, I consider that the objects to be aimed at in Australia are:

1. An income limit of £300; this would include approximately 90% of the workers.
2. There should be no interference with the right of the patient to choose his own doctor.
3. The profession must be represented on a body on which approved societies are also represented, and in this regard the claim of friendly societies for recognition must be allowed, but not as regards the management of medical benefits.
4. The *per capita* payment seems on most grounds to be the most satisfactory.
5. The amount of remuneration is important from the point of view of the public as much as of the practitioner. A poorly paid service means an inadequate service, as more work has to be done to enable a reasonable income to be earned, and the work accordingly hurried.
6. This is most important. The success of the English scheme has shown the advantages of the guaranteeing and controlling of the professional service as far as possible by the profession. This is attested by such authorities as Falk in his book, "Security against Sickness".

To these should be added:

1. The scheme should be a Commonwealth one and uniform.
2. The service should be, if possible, financially a complete one—general practitioner, pharmaceutical, specialist, dental and institutional. If a complete scheme is not possible now, then this ideal service should be aimed at later.
3. The service should be given to dependants.
4. The amount of regulation by officials should be as small as is consistent with efficiency.

In conclusion, the profession must remember that it serves the public, and in considering any health insurance scheme must take the view that the service must be equitable, or the scheme is doomed to failure. All the members of the profession must take an interest in the development of medical service under a national insurance act. They must realize that it protects the family relationship to their patients, and that it is the bulwark against straight-out nationalization of the profession. It is a vital matter, one on which we must be well informed, and one which cannot be left to a few members to settle. Unity of action may be necessary, but the experience of the profession in England shows that if we stand together in reasonable demands we must achieve our objective.

#### THE SIGNS AND SYMPTOMS OF *TÆNIA SAGINATA* INFESTATION.

By H. BOYD PENFOLD, M.B., B.S. (Melbourne),  
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(From the Baker Institute of Medical Research,  
Alfred Hospital, Melbourne.)

ALTHOUGH the symptoms produced by saginata tæniasis are of very little value in making the diagnosis of the condition, I am recording our findings at the Baker Institute for two purposes: first, to correct the popular misconceptions that the main symptoms are large appetite, loss of weight, nervous irritability and *pruritus ani* and *nasi*; and, secondly, to remind practitioners that the symptomatology may be similar to that of duodenal or gastric ulcer, cholelithiasis and, very occasionally, appendicitis. Tæniasis must, therefore, be included in the differential diagnosis of these conditions. Doubtless clinicians in Syria and other countries where *Tænia saginata* abounds, are well aware of the symptomatology, but to our knowledge it has not been fully recorded.

Some of the symptoms observed by workers<sup>(1)</sup> on infestation with *Diphylobothrium latum* closely correspond with those which we have noted in saginata tæniasis.

The signs and symptoms of tæniasis as described by Hirsch<sup>(2)</sup> (1879) are not in agreement with our observations. The method of obtaining cases would in all probability have a considerable influence in the determination of the relative frequency and severity of various symptoms.

The majority of our cases were obtained by the offer of a reward of £5 for a complete tapeworm. This was advertised in the Press and in circulars sent to doctors, pharmacists and others. If it had not been for the reward, many of these patients, who were free from troublesome symptoms, would not have sought treatment. Although Table I shows a high percentage of patients with symptoms, it must be remembered that in the large majority the symptoms were so trivial that they did not induce patients to seek treatment nor to complain of them unless leading questions were asked. In general the patients were in good health.

The signs and symptoms here recorded are attributed to the infestation because they were present while the patients were infested, but were not present before infestation nor yet after the patient was cured. Some persons complained of abdominal pain while infested and continued to do so after being cured. Such a symptom is naturally not included amongst those due to the presence of tape-worm.

The rewards given to the patients made the tracing of them after treatment a comparatively simple matter.

As a general rule the signs and symptoms were present only when a fully grown worm or a large number of worms was harboured. After unsuccessful treatment, when the greater portion of the worm was expelled but the head was retained, the symptoms would disappear until the worm had again grown considerably.

#### Total Number of Cases and Worms.

Table I gives the frequency of the signs and symptoms of 100 consecutive patients who together harboured a total of 219 specimens of *Tænia saginata*.

TABLE I.

The Signs and Symptoms Complaind of by 100 Consecutive Patients Infested with *Saginata Tæniasis*. (These were present during the infestation only.)

Signs or Symptoms.	Number of Patients Exhibiting Them.
Segments noticed by patients in the stools .. .. .	98
Segments noticed by patients on the underclothing .. .. .	93
Segments vomited .. .. .	2
Abdominal symptoms: .. .. .	61
Pain .. .. .	47
Pain only .. .. .	21
Pain together with other digestive disturbances .. .. .	26
Digestive disturbance (other than pain alone) .. .. .	40
Digestive disturbance only (other than pain) .. .. .	14
Abdominal tenderness .. .. .	11
Giddiness .. .. .	37
Appetite: .. .. .	
Increased (5 in the sense of frequent meals) .. .. .	7
Decreased .. .. .	3
Variable .. .. .	Doubtful
Weight: .. .. .	
Increase .. .. .	0
Decrease .. .. .	0
Bowel: .. .. .	
Constipation .. .. .	0
Diarrhoea .. .. .	0
<i>Pruritus ani</i> .. .. .	2
Lassitude .. .. .	4
Nervous irritability .. .. .	1
Nasal pruritus .. .. .	0
Pyralism .. .. .	0
Headache .. .. .	1
Vague aches and pains in musculature .. .. .	Doubtful
Blood changes .. .. .	See Table II

#### Age of Patients.

The average age of the patients was thirty years, and the variation in age was from three and a half to seventy-two years.

#### Duration of Recognized Infestation.

The duration of recognized infestation averaged thirteen years and varied from a few days to a maximum of sixty years.

#### Nationality.

The series of patients comprised 52 British Australians who harboured amongst them 54 beef tape-worms, 47 Syrians harbouring 163, and one Greek with two. Without exception the patients had acquired their infestations in their respective native lands.

#### Sex.

Of the 100 patients, 60 were females and 40 were males. Of the 52 British patients, only 19 were males and 33 were females. Included in the 19 males were four children under eight years of age and one butcher. This observation that females are more likely to become infested than males, especially when the consumption of measly beef is infrequent, agrees with that of other workers.

#### Beef-Eating Habits.

The 48 foreigners had all eaten raw beef frequently. Of the 52 Australians, 38 admitted having eaten raw or almost raw beef two to six months before infestation was noticed. The remaining fourteen had no recollection of eating raw or grossly underdone beef.

#### Comments on Signs and Symptoms.

*The Noticing by the Patient of Segments in his Stools.*—Only two patients did not notice segments, and as they had no definite symptoms we are unable to suggest for how long they were infested. One of these patients<sup>(3)</sup> had an apparently spontaneous cure after passing, at an interval of three months, two long lengths of worm. During the interval the patient did not examine her motions. The second patient<sup>(3)</sup> was cured after vomiting at least portion of the worm, most likely as the result of the administration of an anæsthetic. Similarly, this patient had no other symptoms and had not examined her stools.

These two cases in no way indicate that patients may harbour mature worms without detached segments being expelled in the fæces. Similarly, since the durations of infestation are not known, we cannot conclude that segments may escape the patient's notice for a considerable period. However, a third case, not included in the hundred, is worthy of notice.

The patient noticed persistent and almost continuous *pruritus ani* for one year. He was then treated with male fern, when twenty-five feet of worm were expelled, and the *pruritus ani* disappeared and had not returned when we saw him three months later. We had not the opportunity to identify as *Tenia saginata* the specimen passed, but the patient's medical attendant thought it was.

The fact that the patient had never been out of Australia suggests strongly that this was the case. We have never found *Tenia solium* or *Diphyllobothrium latum* acquired here. This patient was certain that he had not passed any segments in the motions nor found any on the underclothing during the twelve months while the *pruritus ani* was present.

*Segments Noticed by the Patient on the Underclothes.*—Seven patients during the course of their infestation did not notice segments on the underclothing and were not aware of segments crawling through the anus when defæcation was not taking place. Two of the cases have just been described, as the patients also did not notice segments in the stools. Of the remaining five, two were known to have been infested for one year, and the other three for only one to three weeks.

The 93 patients who complained of detached segments crawling through the anus, gave very varied accounts of the frequency of this occurrence. In the majority it was not a frequent occurrence, but in many it took place almost daily, and some stated that more segments were found on the underclothing than in the fæces. In a few cases the finding of segments on the underclothing was the first sign noticed. An explanation of these variations is not known to us.

*Segments Vomited.*—Only two of our patients vomited segments, one after a general anæsthetic and the other during the course of pneumonia.

*Abdominal Symptoms.*—Abdominal symptoms were almost always referable to the epigastrium. Occasionally pain was complained of in the hypochondria, in the lumbar region or in the lower part of the abdomen. The types of pain varied greatly. Amongst the descriptions given by patients were vague ache, hunger pain relieved by food, colic of varying severity, or stabbing pain.

The nature of the digestive disturbances other than pain was also very variable. Amongst the complaints were: sinking, hungry feeling (this was a very frequent description), distension, vague discomfort, heavy feeling, gnawing sensation, empty feeling, appreciation of worm movements, flatulence, water-brash and nausea. In this regard we should like to direct attention to the work of Boyden and Righer,<sup>(4)</sup> who showed in eleven medical students that a slight electric stimulus to the gastric mucosa produced a ring contraction locally and a peristalsis of the gut distal to the contraction. This reaction was observed by means of the fluoroscope. The sensory impressions resulting from this stimulation were curiously varied, ranging from barely perceptible feelings of pressure, gnawing sensations and heartburn to dull and severe colicky pain.

At least four patients had the typical duodenal ulcer sequence of pain, food, comfort, pain, the pain occurring two to four hours after a meal. Although the tenderness was not absolutely localized to the position of the duodenum, clinically

the pain of each of the four patients was similar to that of duodenal ulcer. Two of the patients were given a barium meal and were examined by X rays, and nothing suggestive of ulcer was seen. In all four cases the symptoms disappeared within twenty-four hours of treatment and had not recurred three to twelve months later. There were many borderline cases in which one would usually suspect the patients to be ulcer subjects.

In two cases gall-stone colic was simulated. We saw one of the patients in an attack and thought there was little doubt that she was passing numerous small stones down the cystic duct. However, both cholecystograms were normal, and the pain in both cases disappeared immediately after expulsion of the worm. It had not recurred six to twelve months later, although previously it was of frequent occurrence.

We did not see any cases the symptomatology of which suggested appendicitis, but an appendicectomy was performed by an experienced practitioner in one such case. The appendix appeared normal, and the diagnosis of *Tania saginata* infestation was made the following day, when segments were found in the patient's stools.

**Abdominal Tenderness.**—No patient, except two neurotics, had acute tenderness. The tenderness was almost invariably diffuse and in the epigastrium.

**Giddiness.**—Of all the patients, 37% complained of giddiness. The majority of these noticed it when they were hungry through being late for meals. Others noticed that giddiness was induced by stooping, running, much standing or walking, or on first getting up in the morning.

**Appetite.**—Of the seven patients whose appetite was increased, only two ate noticeably larger meals when infested. The other five ate frequent small meals to prevent the sinking, hungry feeling or giddiness. Three patients had noticeably small appetites while infested, but there was no corresponding change in weight. Owing to the difficulty of arriving at a normal standard, we are not in a position to give the number of patients with a variable appetite, although variability appeared to occur in some cases.

**Weight.**—We found no evidence to suggest that the patient's weight was reduced directly by *Tania saginata* infestation. Three patients lost weight because of grossly injudicious handling. One patient was starved and given ineffective anthelmintic treatment every second day for six months. One lost weight until she was reassured that *Tania saginata* was practically harmless. Numerous patients gained weight during but also after the period of infestation.

**Bowels.**—Neither constipation nor diarrhoea was a significant symptom. Diarrhoea, as described by Leuckart and numerous other workers, was not noted, although we specially inquired from each patient.

**Pruritus Ani.**—Apart from the anal irritation experienced while segments were actively crawling

through the anus, pruritus was complained of by only two patients; in neither was it very troublesome.

**Lassitude.**—Lassitude was distinctly noticeable in four cases.

One patient did not admit it while he was infested, but when he returned six months after successful treatment he realized that he was a different man. He had more energy for work and amusement, and socially he was quite changed. While infested, he was dull and had no inclination for company or amusement; after treatment he was vivacious and interesting. His condition while infested was apparently not neurotic, as he had harboured the parasite for nine years, and when first seen he said that he knew the tape-worm did not do him the slightest harm, and therefore he had not troubled trying to get rid of it.

Another business man, who had been infested with five taeniae for twenty years, although he did not worry about his infestation, had to drive himself to keep up with his work. After successful treatment his lost energy returned, although no other known alteration was made in his life.

Lassitude, like variable appetite and abdominal tenderness, is a hard symptom to assess; we must therefore admit that it may have occurred to a slight degree in more patients than we have recorded.

**Nervous Irritability.**—Nervous irritability was marked in one child who had night terrors, but it is difficult to be certain that it was due to the infestation and not to the highly excitable and over-indulgent parents.

**Other Symptoms.**—Nasal pruritus and salivation did not occur in any patient. Headache appeared to be caused by the infestation in only one case. Vague aches were complained of by several, but may not have been caused by the parasites.

It might be mentioned here that none of our patients, after expulsion of the adult parasite, had any signs or symptoms suggestive of cysticercosis. It has frequently been observed that man infested with *Tania solium* may also acquire the cystic stage *Cysticercus cellulosæ*. Vosgien reported 907 such cases. The larval stage of *Tania saginata* is said by most authorities not to occur in man. However, one case was reported by Fontan<sup>(5)</sup> (1919) and the claim was accepted by Brumpt.

Before proceeding to describe the blood changes we observed in 20 cases of *Tania saginata* infestation, I should like to mention a few matters of interest.

A patient, aged forty-nine years, came to our notice suffering from pernicious anaemia. Her red blood cell count at the time was 1.8 million per cubic millimetre of blood, and she responded very well to treatment with iron and liver. One year previously she had had a similar attack of anaemia, but at that time had harboured *Tania saginata* for eighteen years. Her tape-worm was completely expelled and she was given liver with very good results. She discontinued its use and one year later had the relapse in which we first saw her. I regard this case as one of pernicious anaemia associated with *saginata* taeniasis but not caused by it.

Cases of this nature have frequently been reported before; a recent report being by Becker<sup>(6)</sup> (1931).

I should like to draw attention to a case reported by Benedict<sup>(7)</sup> (1926).

This patient developed the signs and symptoms of acute cholecystitis, and when he was operated on during the fourth day of his illness several pieces of *Tania saginata*, in length totalling ten feet two inches, including the head, were withdrawn from the gall-bladder.

Another interesting report is by Christopherson and Izzedin<sup>(8)</sup> (1918). They describe a case of complete intestinal obstruction for sixteen hours. At operation the abdominal distension was relieved by six punctures of the small intestine. The diagnosis of intestinal obstruction due to *Tania saginata* was made the day following operation, when two to three pints of *Tania saginata* were passed.

Cases similar to the last two mentioned, like those referred to by Leuckart, in which *Tania saginata* was found in the urinary bladder of a female patient, are apparently of very rare occurrence.

**Blood Changes.**—Twenty consecutive cases of *Tania saginata* infestation were examined hæmatologically. Table II summarizes the observations that were made. The blood samples were taken one to three hours after the patients had had luncheon, but the blood volumes were not estimated. When the differential white cell counts were done, 300 to 500 cells were examined in each case.

#### Comments on Table II.

Two patients, numbers 4 and 13, were mildly anæmic. Four months after the successful treatment of patient 13, his red blood cell count had risen to 4.7 million per cubic millimetre of blood. Patient 4 had not improved in respect of his anæmia three months after having been cured of the tæniasis.

With the exception of patient 13, the number of white cells per cubic millimetre of blood was within normal limits. The white cell count of patient 13 rose to 5,000 four months after the worms were expelled.

Sixteen of the twenty patients showed a relative lymphocytosis varying from 33% to 59%. This still existed three months after the patients had been cured. Only one of these patients was under the age of fifteen years. Absolute counts are not tabulated. The duration of infestation did not appear to influence the presence or degree of the relative lymphocytosis. The four patients not showing a relative lymphocytosis did not have an absolute lymphocytosis either.

Only two of the twenty patients had an eosinophilia. The eosinophile cells represented 13% of the white cells in one case and only 6% in the second. It is doubtful whether in this latter case the condition should be called one of eosinophilia. A care-

TABLE II.  
The Blood Findings in 20 Cases of *Saginata* Tæniasis.

Number of patient	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Age in years	35	14	22	45	38	21	15	42	29	7	57	27	26	29	46	46	17	43	58	19
Sex	F.	F.	F.	M.	M.	F.	F.	F.	M.	F.	M.	F.	M.	F.	M.	M.	M.	F.	M.	M.
Duration of infestation in years	5.0	2.5	3.0	0.8	20.0	2.5	1.0	3.5	1.2	4.0	51.0	15.0	20.0	20.0	16.0	9.0	14.0	18.0	54.0	1.5
Number of red blood cells in millions per cubic millimetre of blood	5.3	5.5	5.0	4.4	5.0	5.0	4.5	4.8	5.4	5.8	4.9	5.5	4.0	4.9	5.1	5.5	5.0	4.7	5.5	5.3
Percentage of hæmoglobin (Haldane)	100	105	85	105	95	90	85	95	100	80	95	95	80	95	97	120	97	98	96	98
Colour index	0.94	0.95	0.85	1.2	0.95	0.9	0.94	1.0	0.92	0.69	0.97	0.87	1.0	0.95	0.95	1.1	0.97	0.96	0.9	0.92
Average diameter of red blood cells (Eve's haemocytometer)	6.88	6.88	7.17	7.17	7.02	7.17	7.17	7.17	7.02	6.88	7.17	7.32	7.13	7.64	7.17	7.64	7.02	7.32	7.17	7.17
Number of white cells in thousands per cubic millimetre of blood	6.5	11.0	9.0	12.0	7.5	7.4	7.0	7.0	6.0	10.6	7.3	11.0	4.0	7.0	12.0	7.8	7.6	6.0	6.0	6.0
Percentage of white blood cells:																				
Polymorphonuclear cells	60	75	68	46	57	66	67	55	46	37	52	48	67	72	57	46	53	59	57	52
Neutrophile cells	55	71	66	41	55	64	60	53	33	33	50	43	63	67	53	44	51	58	55	50
Eosinophile cells	5	3	2	4	2	2	6	2	13	4	2	5	3	5	4	2	2	1	2	2
Basophile cells	0	0.5	0.6	1	0	0.4	1	0	0	0	0	0	1	0	0	0	0	0	0	0
Percentage of white blood cells:																				
Lymphocytes	37	23	27	53	40	33	33	41	50	59	41	51	29	26	40	50	44	37	39	42
Small lymphocytes	32	17	10	17	9	7	20	24	38	19	24	49	28	19	28	44	36	33	32	39
Large lymphocytes	5	6	17	36	31	26	13	17	12	40	17	2	1	7	12	6	8	4	7	3
Monocytes	3	2	5	1	3	1	0	4	4	4	7	1	4	2	3	4	3	4	4	6

ful history was taken and examination made of the patient with 13% of eosinophile cells, but no cause for eosinophilia, other than the presence of *Tania saginata*, could be found. This patient had been infested for 1-2 years. These observations disprove the commonly held doctrine that saginata teniasis is frequently associated with an eosinophilia. Leiper<sup>(9)</sup> (1928) found in two cases of experimental infestation with *Diphyllobothrium latum* that at first the eosinophile cells rose so that by the end of the first three weeks of the infestation they formed 15% or 16% of the white cells, but thereafter diminished to 2%. Benedict<sup>(7)</sup> (1926) found that his patient, who had been infested for at least two years, had an eosinophile count of 14%. Pagniez and Lerond<sup>(10)</sup> (1926) described a patient infested with *Tania saginata* who had an eosinophile count of 70%.

#### Summary.

1. The symptoms and signs found in 100 cases of saginata teniasis have been recorded.
2. In the great majority of cases symptoms, if present, were mild in character.
3. The most frequent and valuable sign is the finding of segments in the stools and on the under-clothing.
4. The most frequent symptoms are digestive disturbances and giddiness.
5. The blood of 16 out of 20 patients disclosed a relative lymphocytosis.
6. A definite eosinophilia was found in only one of twenty patients examined.

#### Acknowledgement.

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#### COMPARISON OF PUNCTATE BASOPHILIA AND RATIO OF LARGE TO SMALL LYMPHOCYTES IN THE DIAGNOSIS AND PREVENTION OF LEAD POISONING.

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#### Nature of Investigation.

In a previous paper<sup>(1)</sup> it was stated that the magnitude of the ratio of large lymphoid cells to small lymphocytes was more closely related to the clinical condition in cases of lead poisoning than was the stippled cell count. In the present paper a detailed comparison of these two factors in relation to the clinical condition is made. They are also considered in relation to the concentration of lead in the urine.

#### Scope of Investigation.

Since the inception of this investigation stippled cell counts on 750 slides have been made, and the ratio of large to small lymphoid cells in nearly the same number of slides has been determined. One hundred and eight slides were also examined by the dark ground illumination.

The number of persons examined was 313. In the detailed comparison 238 persons have been included, the difference in numbers being due to the facts that a large number have been examined since the compilation of statistics was commenced, and that cases have been excluded in which other factors than lead, such as appendicitis, tonsillitis, the effects of gases from explosives *et cetera*, may have contributed to the condition.

Three hundred and thirty-eight determinations of the concentration of lead in the urine of 270 different persons have also been undertaken. In 114 of these, however, blood samples were not taken at the time the urine was collected. These latter results have already been considered from a different aspect in a previous paper.<sup>(2)</sup>

#### Methods of Examination for Stippling.

**Staining.**—Much of the discrepancy in the results of different investigators as to the presence or absence of stippling, and as to its extent if present, has undoubtedly been due to differences in technique. Another factor has been the time that has elapsed between the last exposure to a lead hazard and the taking of the blood samples.

In discussion of the work of other investigators, authors frequently do not mention the stain used by the former. It is important, therefore, that in all records of investigations of this nature details of the technique used should be given.

The stain used was Sellers's<sup>(3)</sup> stain, made up as follows, as recommended by Mathew,<sup>(4)</sup> Nelson<sup>(5)</sup> and others:

Methylene blue . . . .	0.5 gramme.
Sodium bicarbonate . .	3.0 grammes.
Distilled water . . . .	100 cubic centimetres.

The films, after drying in air, were fixed with methyl alcohol (acetone-free, for microscopic work,

manufactured by Burroughs Wellcome and Company) for three minutes. They were then dried in air and stained for 45 to 60 seconds and washed in distilled water until only a faint green green tinge remained. They were dried by standing in a desiccator containing fused calcium chloride.

It is not suggested that the presence of the hygroscopic agent is necessary; it merely hastens the drying. It is, however, very advisable to allow the slides to dry in a dust-free atmosphere, particularly when the dark ground technique is subsequently used. Drying by blotting paper or even by hardened filter paper is definitely not recommended, especially for dark ground work. Even the hardened filter paper leaves small particles of cellulose on the film, the presence of which requires the examination to be much more carefully made if mistakes are to be avoided.

Tap-water may be found quite satisfactory for washing, and was used in many cases.

It is important when the presence or absence of stippling is used as an aid to diagnosis, and especially in relation to prevention, that the method used should reveal all potentially stippled cells.

The methods of Wright, Giemsa, Jenner-Giemsa, and Sellers have been compared from this point of view. It was found that the method of Giemsa, the Jenner-Giemsa method, and Sellers's method gave, within reasonable limits of error, substantially the same counts. Wright's stain was definitely unsatisfactory. It was obtained, already made up, from Brisbane. It is not known to the author how effective it may be when freshly made up, and when the films are stained so as to exhibit finally a definite blue colour, as recommended by Aub and co-workers.<sup>(6)</sup>

Table I shows the stippled cell counts obtained in a number of cases with the different stains. The films in any particular case were taken at the same time, stained within a few minutes by the different methods and examined within a short time, generally half an hour, of one another. The figures show the stippled cells per million red cells.

TABLE I.

Wright Stain.	Jenner-Giemsa Stain.	Giemsa Stain.	Sellers Stain.
0	0	—	280 finely 200 polychromatic
300 plus 300 finely	—	—	1,140
0	2,070	—	2,540
—	900	—	2,300
—	550	—	700
—	2,070	—	500
280	125	200 plus 400 finely	1,900
0	130	—	100
0	700	—	750
160	400	—	—
80	140	—	280
—	150 finely	0	100 finely 96 finely 96 doubtful
—	—	200 finely 160 finely	200 finely 100
—	90	—	—

In routine tests of the employees of Mount Isa Mines Limited, Wright's stain had been used and

the films so stained and washed as to show a pink colour.

A direct comparison of the result in six cases in which films were stained by Wright's and Sellers's stains, shows that with the former 660 and with the latter 4,570 stippled cells per million red cells were counted.

A similar comparison between Jenner-Giemsa stain and Sellers's stain in nine cases showed that with the former 6,670 and with the latter 7,146 stippled cells per million were counted.

The results showed definitely that Wright's stain as used was unsatisfactory. No criticism is offered of the use of freshly made-up Wright's stain when the films are stained so as to exhibit a blue tinge after washing and drying, since this method has not been tested. Aub and co-workers<sup>(6)</sup> state that unless this is done Wright's stain may not show any stippling, even when many potentially stippled cells are present.

Jenner-Giemsa, and Sellers's stains give substantially the same counts, but the latter is simpler to make up and use. It has the advantage also that films stained by it are very suitable for the dark ground examination. Sellers's stain was therefore adopted. It was made up freshly at about three-weekly intervals.

The technique for staining and examination in the determinations of the ratio of large to small lymphocytes has already been described.<sup>(1)</sup>

**Microscopic Examination.**—The films were examined with a Zeiss apochromatic oil immersion  $\times 60$  objective and  $\times 10$  eyepiece. About twenty-five fields were examined and the number of cells per field was determined approximately from a count of the number in a diameter as described by Badham.<sup>(8)</sup>

Actual counts of the cells in a field and determinations by calculation from the number in the diameter showed that the error by the latter method was not greater than about 16%. This was to a large extent compensated for by the larger number of fields examined in a given time by this method as compared with the number examined when using an ocular grid. By using a  $\times 90$  objective and a  $\times 15$  eyepiece, larger counts were naturally obtained, but the number of cells per field is much less, and a much longer time has to be spent in an examination; so for routine purposes the combination previously mentioned was used.

#### Dark Ground Technique.

The same optical combination was used. For producing dark ground illumination, a Siedentopf "change-over" condenser was first used in a few cases. For the majority a Zeiss "Cardioid" condenser was used. Illumination was by a Zeiss arc lamp.

#### Classification of Subjects.

After this work had proceeded some way, laboratory findings were used as aids to diagnosis and assessment of cases as compensatable or otherwise;

but for the purposes of this paper all cases have been judged as far as possible from the clinical standpoint. The subjects have been divided into three classes, A, B and C.

Class A contains those who exhibited the more severe symptoms and clinical signs. It consists mostly of those who were compensated for lead poisoning. It also includes some who were regarded as requiring complete removal from a lead hazard and treatment, but who were allowed to work at a non-hazardous job.

Class B contains those subjects who exhibited less severe symptoms and clinical signs. Some were placed on compensation, being border-line cases. Others were removed from a lead hazard, but otherwise had no treatment other than that directed towards overcoming some constipation, or improving appetite, or palliative treatment for arthralgia *et cetera*. Others were allowed to continue at work in a lead hazard, but were treated by thiosulphate injections.

Class C includes those subjects who had no symptoms whatever and who had reported for tests just as a precautionary measure. It also includes some who had very mild symptoms which did not necessitate treatment or removal from work.

In classifying cases regard was paid, among other aspects, to the time required for the subjects to be restored to normal health. In order to afford workers in other places some basis of comparison, it might be pointed out that the majority of all subjects in class A were ambulatory. There were four subjects with severe abdominal colic, persistent vomiting and constipation, two subjects with very pronounced extensor weakness of the forearm, two subjects with definite wrist-drop, who, however, were both very heavy drinkers. In this connexion, Badham states that he has never observed a case of true wrist-drop which was not associated with alcoholism. The symptoms most frequently complained of were loss of appetite, nausea, vomiting, loss of weight, obstinate constipation, abdominal colic, abdominal pain, both hypogastric and epigastric, muscular weakness, pains in the limbs, which included the so-called arthralgia, and also cramping pains in the muscles, especially on exertion, headache, fatigue, breathlessness on exertion, pain in the back in the lumbar region.

The signs most frequently observed were pallor, and some loss of subcutaneous fat, especially in the face. Burton's line was not observed very frequently, although it is admitted that it was not always looked for, since it is not of very great value.

In only a few cases was a very pronounced degree of anaemia present. In the earlier stages, red cell counts and determinations of the percentage of haemoglobin present were made; but since it was found that quite severe symptoms could be present without any pronounced anaemia, these determinations were gradually dropped, except in a few cases in which anaemia was obviously present. As a routine, approximate values for the haemoglobin

percentage were obtained by the use of Tallquist papers. In most cases the fall in haemoglobin value did not go beyond 25% to 20%.

No cases of encephalopathy were observed.

#### Method of Presentation of Results.

The method adopted for presenting the results is to show the distribution of punctate basophilia counts and the ratio of large to small lymphocytes in the three classes A, B and C, and also to give average values for the different magnitudes.

In addition, correlation coefficients between the concentration of lead in the urine, the stippled cell count, and the ratio of large to small lymphocytes have been determined.

#### Punctate Basophilia.

Punctate basophilia has been divided into two classes, "coarse" and "fine". Any such division must depend, in the absence of actual measurement of size, a uselessly tedious process, on the individual observer. Some of the stippled cells were orthochromatic, that is, they stained light green, while others were polychromatic. Thus the stipples appeared as dark blue dots on a faintly green background of cytoplasm, or on a bluish background.

Finely stippled cells were sometimes orthochromatic with very fine dark blue dots on a light green background, but much more frequently the finely stippled cell was polychromatic, and many of them might at first be regarded as polychromatic cells. Careful examination revealed very fine dots, even with light ground illumination.

These cells were very frequently oval in shape and often much larger than the usual unstippled cells. They usually showed one larger stipple and light rounded area similar in appearance to that of the nucleolus in cells of the lymphocytic series. This was never observed in the coarsely stippled orthochromatic cells.

Coarsely stippled cells were of all relative sizes, whether orthochromatic or polychromatic. The finely stippled orthochromatic cells were also of all sizes, but the finely stippled polychromatic cells were only infrequently smaller than the normal unstippled cells. They were usually larger.

Under dark ground illumination the stippled counts were always larger than with light ground illumination for the same slide, both as regards fine and coarse stippling.

One would expect the dark ground method to give a larger count for the coarser stippled cells, since a bright spot on a dark background appears larger than a dark spot on a bright background, and therefore stippling which might just miss being classed as "coarse" by the light ground method might be so classed when examined by the dark ground method. This, however, is thought not to account for all the increase in the coarsely stippled count. It is considered that the dark ground method reveals a coarse stippling which is not easily seen by the light ground method.

Mathew<sup>(4)</sup> states that coarse and fine stippling were found in the same film, but never in the same cell, whereas Nelson<sup>(5)</sup> states that both were sometimes found in the same cell. Nelson's view has been confirmed in this work both as regards examination by light ground and dark ground illumination.

The blood films were examined in most cases while the subjects were still at work or within a day or two of their stopping work. In a few cases in Class A, however, a week or two had elapsed between the stopping of work and the blood examination, and in a few cases the subjects had had some treatment before the examination was done.

TABLE II.  
Total Stippled Count. Light Ground Illumination. Sellers's Stain.

Stippled Cells per Million Red Cells.	Class.					
	A.		B.		C.	
	Number.	Per-centage.	Number.	Per-centage.	Number.	Per-centage.
NH .. ..	0	0	3	4.8	12	11.0
1-1,000 ..	15	24.6	24	35.1	60	55.0
1,001-2,000 ..	17	27.9	19	30.2	20	18.4
2,001-3,000 ..	14	23.0	8	12.7	9	8.3
3,001-4,000 ..	4	6.5	3	4.7	3	2.8
4,001-5,000 ..	5	8.2	2	3.2	3	2.8
5,001-6,000 ..	2	3.3	2	3.2	2	1.8
6,001-7,000 ..	1	1.6	1	1.6	0	0
7,001-8,000 ..	0	0	1	1.6	0	0
8,001 and over ..	3	4.9	0	0	0	0
Total .. ..	61		63		109	
Average value ..	2,560		1,090		1,087	
Standard deviation	±3,000		±1,615		±1,135	
Standard error ..	±384		±234		±109	

TABLE III.  
Coarsely Stippled Count; Light Ground Illumination; Sellers's Stain.

Stippled Cells per Million Red Cells.	Class.					
	A.		B.		C.	
	Number.	Per-centage.	Number.	Per-centage.	Number.	Per-centage.
NH .. ..	5	8.2	14	22.2	41	37.6
1-1,000 ..	24	39.3	34	54.0	53	48.6
1,001-2,000 ..	18	29.5	8	12.8	9	8.3
2,001-3,000 ..	4	6.5	3	4.7	2	1.8
3,001-4,000 ..	5	8.2	3	4.7	1	0.9
4,001-5,000 ..	0	0	0	0	1	0.9
5,001-6,000 ..	1	1.6	0	0	2	1.8
6,001-7,000 ..	1	1.6	0	0	0	0
7,001-8,000 ..	1	1.6	1	1.6	0	0
8,001 and over ..	2	3.3	0	0	0	0
Total .. ..	61		63		109	
Average value ..	1,810		810		480	
Standard deviation	±2,680		±1,240		±1,020	
Standard error ..	±340		±160		±100	

In practically all cases in Classes B and C the examination was done while the subjects were still at work.

Table II shows the distribution of the total stippled cell count per million red cells, and Table III that of the coarsely stippled cells for the three classes A, B and C. The percentages refer to the particular range of values in each class as percentages of the total examined in that class.

Table IV shows the distribution of the total stippled cell count divided by the corresponding ratio of large to small lymphocytes in the three classes. The percentage column refers to the number of cases falling in the particular range of values of the factor expressed as a percentage of the total examinations in each class.

TABLE IV.  
Light Ground Illumination; Sellers's Stain.

Total Stippled Cell Count ÷ Ratio of Large to Small Lymphocytes.	Class.					
	A.		B.		C.	
	Number.	Per-centage.	Number.	Per-centage.	Number.	Per-centage.
NH .. ..	0	0	3	4.8	12	11.1
1-500 .. ..	9	14.8	19	30.1	72	66.7
501-1,000 ..	6	9.8	15	23.8	13	12.0
1,001-1,500 ..	12	19.7	8	12.7	4	3.7
1,501-2,000 ..	9	14.8	7	11.1	1	0.9
2,001-2,500 ..	7	11.5	3	4.8	4	3.7
2,501-3,000 ..	4	6.5	3	4.8	0	0.0
3,001-3,500 ..	1	1.6	1	1.6	1	0.9
3,501-4,000 ..	6	9.8	2	3.2	0	0.0
4,001 and over ..	7	11.5	2	3.2	1	0.9
Total .. ..	61		63		108	
Average value ..	2,540		1,380		380	
Standard deviation	±2,830		±2,350		±540	
Standard error ..	±360		±300		±50	

Table V shows a similar tabulation in respect to the distribution of the factor: coarsely stippled cell count divided by the ratio of large to small lymphocytes.

Table VI summarizes the average values for the different magnitudes in the different classes.

This table shows that by incorporating the ratio of large to small lymphocytes in the factor used as an indicator of the condition there are much greater relative differences between the average values for the different classes. For example, considering the total stippled cell count, the average value for Class A is 2.35 times that for Class C and 1.5 times that for Class B. When, however, the ratio of the total stippled cell count to the ratio of large to small lymphocytes is considered, the average for Class A is 6.7 times that for Class C and 1.8 times that for Class B.

Considering the coarsely stippled cell count, the average for Class A is 3.8 times that for Class C, and 2.23 times that for Class B. In the case of the

TABLE V.

Coarsely Stippled Count ÷ Ratio of Large to Small Lymphocytes.	Class.					
	A.		B.		C.	
	Number.	Per- centage.	Number.	Per- centage.	Number.	Per- centage.
Nil .. ..	5	8.2	14	22.2	40	37.0
0-500 ..	15	24.6	30	47.6	58	53.7
501-1,000 ..	10	16.4	8	12.7	6	5.6
1,001-1,500 ..	12	19.7	7	11.1	0	0.0
1,501-2,000 ..	1	1.6	2	3.2	2	1.8
2,001-2,500 ..	4	6.6	0	0.0	1	0.9
2,501-3,000 ..	4	6.6	0	0.0	0	0.0
3,001-3,500 ..	3	4.9	0	0.0	1	0.9
3,501-4,000 ..	1	1.6	0	0.0	0	0.0
4,001 and over ..	6	9.8	2	3.2	0	0.0
Total .. ..	61		63		108	
Average value ..	1,870		750		180	
Standard deviation	±2,560		±2,280		±460	
Standard error ..	±330		±290		±40	

TABLE VI.

Class.	Total Stippled Cell Count per Million Red Cells.	Coarsely Stippled Cell Count per Million Red Cells.	Total Stippled Cell Count ÷ Ratio of Large to Small Lymphocytes.	Coarsely Stippled Cell Count ÷ Ratio of Large to Small Lymphocytes.
A	2,560	1,810	2,540	1,870
B	1,690	810	1,380	750
C	1,090	480	380	180

ratio of coarsely stippled cell count to the ratio of large to small lymphocytes, the average value for Class A is 10.4 times that for Class C and 2.5 times that for Class B.

Comparison of Tables II and III with Tables IV and V respectively shows that there is less overlapping between the classes in the latter case.

Table VII shows the distribution of the values of the ratio of large to small lymphocytes in the three classes.

Inspection of Tables II, III and VII shows that the relative divergences from the average values in the respective tables are much less in the case of the ratio of large to small lymphocytes than in the cases of the total or coarsely stippled counts in each of the classes A, B and C.

An ideal laboratory test is one which gives no overlapping of the values found in one clinical group with those found in another clinical group into which a series of subjects may be divided. Such a test is impossible to find in respect to such a complex mechanism as a human being. The most useful standard is one which gives the least overlapping between the groups. From the point of view of prevention, the test should distinguish between Class C and Classes A and B. From the point of view of compensatability it should distinguish between Classes A and B.

TABLE VII.

Light Ground Illumination; Sellers's Stain.

Range of Values of the Ratio.	Class.					
	A.		B.		C.	
	Number.	Per- centage.	Number.	Per- centage.	Number.	Per- centage.
0.0-0.5 ..	8	12.3	2	3.1	0	0.0
0.51-1.0 ..	23	35.4	9	14.1	0	0.0
1.1-1.5 ..	19	29.2	19	29.7	3	2.8
1.6-2.0 ..	9	13.8	17	26.6	11	10.1
2.1-2.5 ..	3	4.6	7	10.9	17	15.6
2.6-3.0 ..	1	1.5	4	6.3	17	15.6
3.1-3.5 ..	1	1.5	2	3.1	18	16.5
3.6 and over ..	1	1.5	4	6.3	43	39.4
Total .. ..	65		64		109	
Average value ..	1.23		1.72		3.67	
Standard deviation	±0.67		±0.83		±0.603	
Standard error ..	±0.083		±0.108		±0.058	

In Table VIII the results shown in Tables II, V and VII have been summarized in such a way as to compare the usefulness of the ratio and of the total and coarsely stippled cell counts and of the ratio of these latter to the ratio of large to small lymphocytes.

Inspection of Table VIII indicates that the ratio  $R$  gives a clearer distinction between Class C and Class A and between Class C and Class B than does  $T$ ,  $C$ ,  $T/R$  or  $C/R$ .  $R$  gives clearer distinctions between Class A and Class B than  $T$ ,  $C$  or  $T/R$ . However,  $C/R$  is slightly more useful than  $R$  in separating A and B, that is, as an aid to diagnosis of compensatable cases, which constitute the majority of subjects in Class A.  $C/R$  is definitely better than  $C$  alone, and  $T/R$  than  $T$  alone, in separating any class from the others.  $C$  is slightly better than  $T$ .

#### Correlation Coefficient.

Further confirmatory evidence of the closer correlation between the value of the ratio of large to small lymphocytes and the clinical condition than of the stippled cell count with the latter is obtained indirectly by considering the correlation coefficients of the two expressions with respect to the urinary lead. In endeavouring to determine by means of the correlation coefficient whether there is any causal relationship between two phenomena, it must be possible to give numerical values for the phenomena. One cannot express the clinical condition by a numerical factor, but as an approach to doing so, may regard the concentration of lead in the urine as a measure of it.

The correlation coefficients of the ratio of large to small lymphocytes with respect to the urinary lead concentration and of the stippled cell counts with respect to the latter have been calculated for Class A. The results are shown in Table IX.

TABLE VIII.<sup>1</sup>

Observation.	Class.		
	A.	B.	C.
<b>Value of R:</b>			
Equal to and below 2 ..	90.75	73.45	12.9
Above 2 .. .. .	9.25	26.55	87.1
<b>Value of T:</b>			
Equal to and below 1.5 ..	76.91	46.88	2.75
Above 1.5 .. .. .	23.09	53.12	97.25
<b>Value of T:</b>			
Equal to and below 1,000 ..	24.59	43.84	66.04
Above 1,000 .. .. .	75.41	56.16	33.96
<b>Value of C:</b>			
Equal to and below 2,000 ..	52.26	73.02	84.49
Above 2,000 .. .. .	47.74	26.98	15.51
<b>Value of C:</b>			
Equal to and below 1,000 ..	47.53	76.18	86.23
Above 1,000 .. .. .	52.47	23.82	13.77
<b>Value of T/R:</b>			
Equal to and below 500 ..	14.75	34.90	77.77
Above 500 .. .. .	85.25	65.10	22.23
<b>Value of T/R:</b>			
Equal to and below 1,000 ..	24.58	58.60	89.80
Above 1,000 .. .. .	75.42	41.40	10.2
<b>Value of C/R:</b>			
Equal to and below 500 ..	32.78	69.85	90.74
Above 500 .. .. .	67.22	30.15	9.26
<b>Value of C/R:</b>			
Equal to and below 1,000 ..	49.16	84.55	96.29
Above 1,000 .. .. .	50.84	15.45	3.71

<sup>1</sup> Ratio of large to small lymphocytes is designated R. Total stippled cell count per million red cells, T. Coarsely stippled cell count per million red cells, C. The figures shown represent percentages of the total subjects in the particular class which occur within the stated range of values.

TABLE IX.

Correlation Coefficient of Urinary Lead Concentration with Respect to—	Value of Coefficient.
Ratio of large to small lymphocytes .. .. .	0.71
Total stippled count .. .. .	0.566
Coarsely stippled count .. .. .	0.44
Total stippled count ÷ ratio of large to small lymphocytes ..	0.39
Coarsely stippled count ÷ ratio of large to small lymphocytes ..	0.50

There is a very high degree of probability that the closer the numerical value of the coefficient is to 1, the closer the causal relationship between the two phenomena and, conversely, the nearer it is to zero, the less the probability that the two phenomena are causally related.

It is frequently considered that unless the coefficient is greater than 0.5, then there is no causal relationship between the two phenomena con-

sidered. An inspection of the table indicates that the ratio of large to small lymphocytes is much more closely related to the urinary lead concentration, and therefore, by implication, to the clinical condition than the other factors. While not conclusive with regard to the clinical condition, since this is not directly measured numerically, the above results tend to confirm the superiority of the ratio to the stippled cell count as a measure of the former.

#### Concentration of Lead in Urine.

The results of 295 urinary lead determinations are summarized in Table X. Class A in this table includes some values determined when the subject had been away from the hazard for some time and undergoing treatment, but the condition was still sufficiently severe to place the subject in this class. Class B includes some values for cases from Class A in which partial recovery has taken place but the subjects are still in a condition to justify placing them in this class.

TABLE X.

Range of Values in Milligrammes per Litre.	Class.					
	A.		B.		C.	
	Number.	Per-centage.	Number.	Per-centage.	Number.	Per-centage.
0.0 - 0.05 ..	4	5.6	4	5.3	48	32.4
0.051 - 0.10 ..	4	5.6	24	31.6	54	36.5
0.11 - 0.15 ..	17	23.9	31	40.8	28	18.9
0.16 - 0.20 ..	16	22.5	12	15.8	12	8.1
0.21 - 0.25 ..	9	12.7	5	6.6	5	3.4
0.26 - 0.30 ..	8	11.3	0	0.0	0	0.0
0.31 and over ..	13	18.3	0	0.0	1	0.67
Total ..	71		76		148	

Of the 295 determinations, 22 were above 0.25 milligramme per litre. Of these, 21, or 95.4%, were in Class A, none, or 0%, were in Class B, and one, or 4.6%, was in Class C.

Forty-one were above 0.2 milligramme per litre. Of these, 30, or 73%, were in Class A, 5, or 12.2%, in Class B, and 6, or 14.6%, in Class C.

Class C in this table includes 85 values found in the survey the results of which were recorded in a previous paper.<sup>(2)</sup> It is possible that some of the persons whose results are included in this class were showing mild symptoms or signs, and should therefore come in Class B. They were, however, all carrying on with their work.

A more rigid classification, in which all subjects were seen by the author, is shown in Table XI.

Inspection of this table shows, among other things, that 75% of Class C had values equal to or below 0.1 milligramme per litre, whereas 71% of Class B had values greater than 0.1 milligramme per litre.

It has been shown previously that the average value of the urinary lead concentration for subjects who were fit for work was 0.12. Table XI suggests that it is at about this region of values and some-

what above it that we may expect to find mild symptoms developing.

TABLE XI.  
Urinary Lead.

Range of Values in Milligrammes per Litre.	Class.					
	A.		B.		C.	
	Number.	Per-centage.	Number.	Per-centage.	Number.	Per-centage.
0.0-0.05 ..	4	8.9	1	2.0	14	31.1
0.051-0.10 ..	4	8.9	13	26.5	20	44.4
0.11-0.15 ..	9	20.0	24	49.0	9	20.0
0.16-0.20 ..	7	15.6	6	12.2	1	2.2
0.21-0.25 ..	5	11.1	5	10.2	1	2.2
0.26-0.30 ..	6	13.3	0	0.0	0	0.0
0.31 and over ..	10	22.2	0	0.0	0	0.0
Total ..	45		49		45	

The average length of time during which a person may be safely exposed to a hazard which gives sufficient lead intake to cause a lead excretion of 0.1 milligramme per litre (assuming undamaged kidneys) is not known. A very large number of determinations over a long period of time in many individual cases would be necessary to determine this. It is not safe to assume that so long as the urinary lead concentration does not exceed 0.1 milligramme per litre damage to the organism will not result in time. The aim of preventive measures should be to reduce the intake to the lowest value possible.

#### Relation of Stippled Cell Count and Ratio of Large to Small Lymphoid Cells to Urinary Lead Concentration.

In order to illustrate graphically the relationship of the stippled cell count and the ratio of large to small lymphoid cells to urinary lead concentration, average values for the different classes are used. If the individual values of the stippled cell counts or the ratio of large to small lymphoid cells are plotted against the corresponding values of the urinary lead concentration, no clear relation is noticeable; but if the average values for each class are plotted, then it is clearly seen that there is a definite relation between the above-mentioned magnitudes.

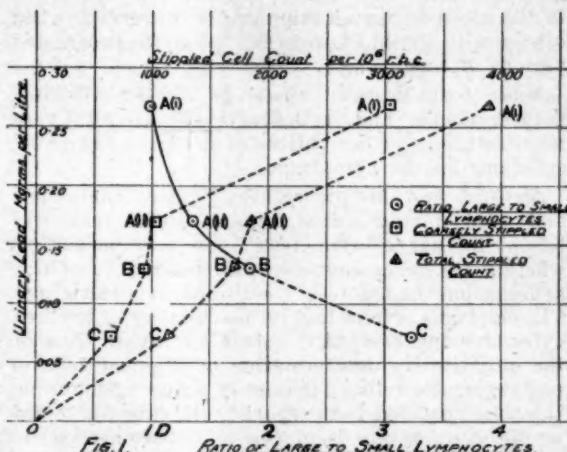
For this purpose Class A has been subdivided into two smaller classes, namely, the more severe cases A(i) and the less severe cases A(ii).

Table XII shows the average values for each class. In this comparison there were 45 cases in Class A, 49 in Class B, and 45 in Class C. These results are plotted in Figure I.

TABLE XII.

Class.	Total Stippled Cell Count.	Coarsely Stippled Cell Count.	Urinary Lead Concentration. Milligrammes per Litre.	Ratio of Large to Small Lymphocytes.
A (i)	3,890	3,040	0.268	0.98
A (ii)	1,850	1,020	0.17	1.35
B	1,700	930	0.13	1.83
C	1,150	660	0.073	3.24

The graph for the ratio of large to small lymphocytes against urinary lead concentration is a fairly smooth curve. Since the value for this ratio in persons without any exposure to a lead hazard is about 1, there must be a point of inflexion between points B and D. Whether C is above or below this point of inflexion is not known. The part BC is therefore shown by a dotted line. The graph shows a definite tendency for the ratio to fall with increasing concentration of lead in the urine above a value in the region of 0.08 to 0.1 milligramme per litre.



The graphs for the stippled cell counts show a marked tendency for the count to increase rapidly above a concentration of about 0.16 milligramme per litre. These graphs are less regular than the graph for the ratio.

These graphs illustrate the fact that the ratio is more sensitive in its response to increasing absorption of lead than is the stippled cell count.

Incidentally it may be pointed out that Table XII clearly indicates the fact, which is fairly generally accepted, that in the severer cases there is usually a greater proportion of coarsely stippled cells relative to the finely stippled. The ratio of the coarsely stippled cells to the finely stippled in the classes A(i), A(ii), B and C are respectively 3.57, 1.23, 1.20, 1.34 to 1. This must not be taken to mean that severe cases with mostly fine stippling will not be found.

From the point of view of the prevention of lead poisoning, the most suitable test is the one which is the most sensitive indicator of deterioration in the worker's condition, and in which there is least time lag between the alteration in the patient's general condition and a readily determined alteration in the magnitude of the factor used. In addition, the test must be such that it can be easily carried out without too much skill and practice.

Many different laboratory aids to the detection of lead poisoning and its prevention have been and are used.

Legge<sup>(9)</sup> regards the strength of hand grip as the most generally useful test in this connexion. It is certainly simple to carry out, but has the objection that it is difficult to be certain of the maximum effort being expended at each test.

The quantitative determination of lead in the blood by means of the quartz spectrograph<sup>(10)</sup> can be carried out rapidly, but requires expensive equipment and highly skilled experimenters.

Lewy<sup>(11)</sup> and Lane and Lewy<sup>(12)</sup> have shown by chronaximetric measurements that degeneration of neurones may take place without any alteration in the blood so far as stippling is concerned, when exposure to a mild hazard takes place for protracted periods of time.

Whitby and Britton<sup>(13)</sup> have shown that stippling, polychromasia and reticulocytosis are different manifestations or derivatives of the same basophilic substance in the cytoplasm.

McCord and his co-workers<sup>(14)</sup> have developed and used during some years a useful test "the basophilic aggregation test", for lead poisoning, wherein the percentage of cells showing basophilic aggregation under test conditions is determined. The emphasis is here laid on the totality of erythrocytes showing basophilic substance rather than on the quantitative determination of stippled cells or polychromatic cells. The test is simple enough, but the time required for preparing the film for microscopic examination is longer than that needed for the ordinary method of staining. In this method the film is allowed to dry for a considerable period, half an hour to two hours or more; a strip extending the length of the film and half its width is then fixed with methyl alcohol, the other half remaining unfixed. The whole film is then stained with methylene blue stain made up with borax. The resulting film shows one half deeply stained, which is used for counting the number of cells per field. The other half shows dark aggregations of basophilic substance against a background of very faintly outlined cells. Counting of these is easy and rapid.

A comparison of the results obtained by this method and by the use of the dark field method with ordinary staining would be interesting.

Stippling is certainly a very obvious alteration of blood cells, but this seems to be no sound reason for assuming that other cells (for example, muscle cells, nerve cells, kidney cells *et cetera*) are not acted on deleteriously until the red cells show stippling. Indeed, in view of the fact that the above-mentioned cells are more highly differentiated than the erythrocytes, they might be expected to be more readily damaged by noxious influences. In the case of nerve cells, or at any rate the muscle cells-nerve combination, this is certainly the case with small doses of lead received over long periods.

While the stippled cell count is certainly of value, the present work has shown that the ratio of large to small lymphocytes is more closely related to the clinical condition than is the stippled cell count. It is thought also that it is a more sensitive

indicator of approaching trouble. To prove this completely would involve large numbers of determinations at short intervals in many different individual cases. In support of this contention it may be stated that it has been found to be extremely rare for the subject's ratio to fall without a corresponding deterioration in his condition until he has reached the stage of recovery in which his condition is that of a healthy non-lead worker, and conversely, a rise in the value of the ratio almost invariably accompanies improvement in the general condition.

The contrast to this is the fact that very frequently the stippled cell count increases markedly as the subject's clinical condition improves. Table XIII shows a number of cases of this. In this table details of the original clinical condition are not shown, but the subjects all exhibited signs or symptoms of lead poisoning in varying degrees at the first dates shown in each respective case.

TABLE XIII.  
Increase of Punctate Basophils with Improvement of Clinical Condition.

Case Number.	Date.	Total Punctate Basophils.	Coarse Punctate Basophils.	Clinical Condition.
I	3/4/36	4,580	3,000	
	17/4/36	5,400	2,700	Improved.
II	19/10/36	2,875	Nil	
	23/10/36	7,200	1,800	Slight improvement.
III	31/8/36	5,000	3,020	
	21/10/36	10,770	4,180	Marked improvement.
IV	7/11/35	1,666	766	
	4/12/35	1,920	1,110	Much improvement.
V	7/9/36	14,100	11,280	
	21/9/36	19,600	6,800	Some improvement.
VI	26/9/36	1,500	Nil	
	12/10/36	1,780	120	Some improvement.
VII	16/12/35	600	840	
	15/1/36	2,100	1,030	Improved.
VIII	4/6/36	2,600	1,450	
	13/6/36	4,160	2,580	Some improvement.
IX	8/6/36	516	260	
	21/7/36	1,000	400	Improved.
X	30/9/35	660	110	
	25/11/35	2,330	1,780	Much improvement.
XI	21/5/35	2,530		
	27/6/35	4,100		Some improvement.
XII	22/2/36	Nil		
	21/3/36	2,125	Nil	Much improvement.
XIII	21/10/35	1,440	1,000	
	5/11/35	1,650	1,200	Some improvement.
XIV	23/4/36	3,300	950	
	16/5/36	2,550	1,330	Very well.
XV	27/2/36	5,100	5,100	
	7/3/36	5,700	5,700	Feels well; wants to work.
XVI	10/8/36	2,020	430	
	14/8/36	4,000	3,000	Good deal better.
	21/8/36	2,630	1,180	Not so well.
	31/8/36	5,840	5,580	Very much better.
XVII	27/4/36	580	220	
	6/6/36	1,540	620	Feels very well.
XVIII	12/3/36	1,820	720	
	31/3/36	2,400	1,140	Much improvement.
XIX	14/9/36	4,700	1,220	
	23/9/36	5,510	2,700	Much improvement.
XX	14/9/36	3,150	1,350	
	25/9/36	6,550	4,150	Much improvement.

Thus 20 subjects out of 124 having varying degrees of lead poisoning showed an increase in the stippled cell count corresponding to improvement in clinical condition. This point has been remarked on by Ferguson and Ferguson,<sup>(15)</sup> who also point to the fall in the stippled cell count which frequently takes place on changing from a lesser to a greater hazard.

Sometimes a deterioration in the clinical condition is accompanied by a fall in the stippled cell

count, but very rarely with an increase in the ratio. The following also illustrates this.

An employee reported for an examination as a precaution and had no complaints about his condition. On account of the high stippled cell count, and in order to observe whether the ratio was falling or not, he was examined again after a short interval. The results were as shown in Table XIV.

TABLE XIV.

Date.	Stippled Cell Count.	Ratio.	Clinical Condition.
7/12/36	4,500; including 1,000 finely.	2.8	No complaints.
9/12/36	2,660; including 1,000 finely.	0.91	Complained of being easily tired at work, and persistent bad headache.

#### Tests as an Aid to Diagnosis.

Regarding any particular test as an aid to diagnosis, the requirements are: (a) that the magnitude of the factor concerned should be closely related to the severity of the condition in the particular case, and (b) that there should be fairly close agreement between the values found in different cases which are of about equal severity so far as clinical judgement can assess them; (c) here again also the smaller the time lag, the better.

With respect to (a), the statement already made, that an improvement in clinical condition is frequently associated with a marked increase in the stippled cell count, and *vice versa*, is a disadvantage of this test. It has already been pointed out that it is extremely uncommon for the ratio of large to small lymphocytes to show any comparable unusual variations.

With respect to (b), whereas the average value in the three classes A, B and C shows a definite general relationship between the clinical condition and the stippled cell counts, in any one group, for instance A, it is found that there are wide relative divergences from the average value. This is illustrated by the values of the standard deviations shown in Tables II and III.

The ratios of large to small lymphocytes in any class show very much smaller relative divergences from the average values of the class.

In order to avoid misuse of the ratio of large to small lymphocytes, it is again pointed out that the ratio in cases of lead poisoning is about the value which may be expected in healthy non-lead workers. The absorption of lead causes an increase in the value of the ratio above that found in healthy people of no known exposure.

In an industry where the hazard is fairly severe and uniform for all workers, the ratio above should be sufficient as a routine control test.

In an industry in which the hazard is not uniform, containing places where the hazard is very light and others where it may be severe, it is necessary to use some other method in addition, in order to indicate whether a low ratio is due to absorption of lead

or merely to the fact that the subject concerned has not absorbed enough lead to cause the ratio to vary from the normal value for the healthy non-lead worker. This other test may be a stippled cell count or determination of the concentration of lead in the urine. Owing to the quickness and simplicity, the former is naturally preferred.

#### Dark Ground Illumination.

In the 108 examinations, nine films of five persons were found with total stippled cell counts of 20,000 or over. All these individuals were suffering from lead poisoning with disability.

In the majority of the films examined the finely stippled cells were more numerous than the coarsely stippled, even in the severer cases. Table XV shows the results.

TABLE XV.

Class.	Number of Subjects.	Average Value of Total Stippled Cell Count.	Average Value of Coarsely Stippled Cell Count.
A .. .. .	26	12,700	7,800
B .. .. .	11	10,300	4,700

Nineteen persons suffering from lead poisoning with disability had an average count for the total stippled cells of 13,800, and six of these, in whom the counts were made for coarse and finely stippled cells, showed an average of 11,000 coarsely stippled cells. In only one film was there a failure to find stippled cells by this method. This was from a subject who, in a film taken a few days later, showed a count of 2,500 with light ground illumination.

A few individuals who had had no known exposure to a lead hazard, had counts of several thousand. This aspect has been very well treated by Nelson and co-workers.

This method is so superior to that in which light ground illumination is used, that it is recommended for routine work. Since, however, most of the previous work on blood films in connexion with lead poisoning had been done by the light ground method, it was decided to use it in the investigation, the results of which are recorded in this paper, and at the same time to make a fairly extensive series of comparative counts. This was done in the hope that some more or less constant relationship would be found between light ground and dark ground counts. This might have enabled light ground counts by one investigator to be translated into dark ground counts by another, and *vice versa*. Unfortunately, the ratio of dark ground to light ground counts, although always greater than one, is very variable. One hundred and four films were counted by both methods, and it was found that the ratio of the dark ground count to the light ground count varied from 1.13 to 11.8, with an average value of 3.5.

*Laboratory Standards.*

The attempt to standardize arbitrarily the relationship between clinical condition and laboratory findings is to be strongly deprecated.

The fact that some laboratory test may be expected to give accurate diagnoses in nine cases out of ten, say, is little comfort to the one who may be unfairly treated as a result of the unimaginative application of arbitrary standards.

Duhig,<sup>(16)</sup> in the "Reports of Enquiry into Lead Poisoning and its Incidence", pages 25, 33 and 34, states that lead poisoning is assumed to imply 1,000 coarsely stippled cells per million. This refers to acute cases. In this connexion the following case is illustrative.

The patient, an exceptionally powerful man, was admitted to hospital on January 27, 1935, suffering from abdominal colic, vomiting, and pains in the limbs. The results of the laboratory tests are set out in Table XVI.

TABLE XVI.

Date.	Stippled Cell Count; Sellers's Stain; Light Ground.	Ratio.	Urinary Lead.	Remarks.
21/1/35	Admitted to hospital.			Symptoms as above.
23/1/35	100	1.45	—	Symptoms as above.
24/1/35	360	0.87	—	Symptoms as above.
25/1/35	370	0.96	—	Severe cramping pains in abdomen.
30/1/35	100	1.60	0.16	Improvement in condition.
17/2/35	—	—	0.17	Improvement.
18/2/35	—	1.96	—	—
20/2/35	—	—	0.113	—
28/2/35	100	2.2	—	Well; discharged.

Thus, while severe symptoms were still present, the stippled count was never above 370 per million. Incidentally the condition was indicated by the ratio of large to small lymphocytes and was confirmed by the urinary lead analyses. This man was granted compensation.

Badham<sup>(17)</sup> gives a list of 32 persons suffering from compensatable lead poisoning. Of these, 13 were examined within a week of leaving the hazard, and one on the ninth day. The time since last exposure of these 14 to lead hazard, and the stippled counts are shown in Table XVII.

TABLE XVII.

Days.	Stippled Count.
1	1,000
1	1,000
3	Sparingly.
7	100
7	Nil
3	Nil
9	Sparingly
4	10,000
7	1,000
6	40,000
4	1,000
4	4,000
1	6,000
5	750

The occurrence of six cases of compensatable lead poisoning in persons who showed less than 1,000 stippled cells per million, when examined within

nine days of their leaving the hazard, out of 14 who were examined within the interval, indicates the inadvisability of adopting an arbitrary standard which the count must reach before a case is considered compensatable.

Duhig recommends that before a count is considered negative three tests should be made at intervals during a period of ten days. Objection to the above criticism may be taken on the ground that if several tests had been made (during a period of ten days) on each of the above who showed counts less than 1,000 at the first count, they might have shown counts of this magnitude or greater. It might, of course, have been so.

As a further indication of the inadvisability of the arbitrary standard of 1,000 coarsely stippled cells per million, it is pointed out that out of 50 persons granted compensation by the medical board, which consisted of three members, six out of the 22 who were more severely affected had counts of less than 1,000 coarsely stippled cells per million, and so did 16 out of the 28 who were less severely affected. Two of the 22 more severe cases were complicated by the fact that the subjects were heavy drinkers. If these are excluded, there were, out of 20, still four who had less than 1,000 coarsely stippled cells per million, that is, 20%.

It cannot be too strongly stressed that reliance on a laboratory standard alone, such as so many hundred stippled cells per million red cells, to diagnose a case or assess its severity, is inadvisable. Careful consideration must be given to the subject's clinical condition as well.

In lead poisoning, which is an industrial disease and is compensatable under the *Workers' Compensation Act*, the difficulty is in deciding whether the subject is fit for work or not. If reliance is placed on the coarsely stippled count as the most important laboratory diagnostic aid, then a considerable amount of injustice may be done. It is true that, generally speaking, the severer the condition, the higher the coarsely stippled cell count, except in some cases in which there has been long exposure to a severe hazard; but there are numerous exceptions to this. A man with 1,000 coarsely stippled cells per million may be in a much worse condition than another with 10,000 to 15,000. Another with 5,000 to 6,000 may be quite well and merely require watching.

The use of some confirmatory tests is imperative in some cases if injustice is to be avoided. Under certain conditions, already mentioned, the ratio of large to small lymphocytes is in itself a better test than the stippled cell count. If both it and the estimation of the urinary lead concentration are used, the diagnosis can be made almost certain.

Thus if a person has a coarsely stippled count of 2,000 per million, a ratio of large to small lymphocytes of 1.0, and a urinary lead concentration of 0.25 milligramme per litre, the chances are hundreds to one that he is suffering from lead poisoning of a compensatable degree.

Again, if one has 700 to 1,000 coarsely stippled cells per million, a ratio of 0.4, and a urinary lead concentration of 0.3 milligramme per litre, then similarly his condition is practically certain to be compensatable.

Neither the stippled cell count, the ratio of large to small lymphocytes, the blood lead nor the urinary lead concentrations may show any divergences from the normal values in the sequelæ of lead poisoning, such as paralysis or nephritis, in which the damage has been done and remains long after any abnormal amount of lead has left the circulation or the tissues concerned. Although obvious, this is frequently forgotten.

In connexion with this, it should be mentioned that frequently the so-called lead arthralgia and muscular pains, usually not of a severe nature, persist after the ratio of large to small lymphocytes has risen well above two, consequent on treatment and/or removal from work, the patient's general condition showing a great improvement. Thus abdominal pains may go, appetite improve, fatigue disappear, and so on, but the limb pains continue for a longer time. Frequently a patient will state: "I now feel very well in myself, but I've still got these pains in the legs and arms." Stippling has often disappeared by this time, or has fallen to a very low figure.

#### Summary.

The stippled cell count, the ratio of large to small lymphoid cells, and the concentration of lead in the urine are considered in relation to the diagnosis and prevention of lead poisoning.

The comparison between the former two methods has been based on three different lines of investigation: (i) comparison of the distribution of the values in three clinical classes; (ii) correlation coefficients between the values of each factor and those of the corresponding urinary lead concentrations in Class A; (iii) the occurrence or otherwise of unusual variations in the values.

The results indicate that the ratio is more closely correlated with the clinical condition than are the total stippled cell count or the coarsely stippled cell count, and it is more useful as a guide both to the prevention and diagnosis of lead poisoning.

The inadvisability of attempting to adjudge the severity of cases by laboratory standards alone is emphasized.

The results of 295 urinary lead examinations are summarized.

When the subject is examined while still at work in the lead hazard, or within a few days of leaving it, one may expect to find lead poisoning with disability when there are present the following: (a) total stippled count, 2,500; (b) coarsely stippled cell count, 1,000; (c) ratio of large to small lymphoid cells, less than 1.5; (d) concentration of lead in urine in milligrammes per litre, 0.15 and over; (e) coarsely stippled cell count divided by the ratio of large to small lymphocytes, 800.

#### Acknowledgements.

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#### Reports of Cases.

##### PRIMARY PELVIC HYDATID CYST IN A FEMALE.

By A. H. PENINGTON, M.B., B.S. (Melbourne),  
Melbourne.

THE occurrence of primary hydatid cysts in the pelvis is regarded by Dew<sup>(1)</sup> as being extremely rare. In many cases in which this diagnosis has been made the evidence has been discredited because of incomplete examination.

The following case appears to fall into the category of a true primary pelvic hydatid in the female, the diagnosis being substantiated by a careful and complete autopsy.

#### Symptoms and Signs.

M.M., a female, aged thirty-one years, was admitted to the Austin Hospital on December 12, 1935. She had been a nurse prior to her marriage in 1931 and had at no time lived in the country. In January, 1933, Caesarean section had been performed for a full-time pregnancy, as a small mass had been felt in the pouch of Douglas, and, being regarded as a cervical fibroid, might have caused some obstruction to labour. She had suffered from pulmonary tuberculosis since 1927, and as a prolonged labour was considered inadvisable, section had been performed by choice. When admitted to hospital in 1935 she had an extensive tuberculous infection of the right lung and slight involvement of the apex of the left lung. She also complained of a severe pain in the lower lumbar region, of a "bearing down" nature, and radiating around to both groins. This pain was especially severe during her menstrual periods, though these were normal in their cycle and duration. She had no dysuria. She was apt to be constipated. The pain had been present intermittently for three months, but was gradually becoming more persistent and severe. Examination of the lumbar spine, sacro-iliac and hip joints revealed no bony abnormality; but pelvic examination disclosed the presence of a large round mass in the pouch of Douglas, not tender, but fixed and pushing the uterus forward and upward.

#### Operation.

Abdominal section was performed by Dr. J. M. Buchanan on April 7, 1936, under spinal anaesthesia. The uterus was found to be pushed forward, anteverted and immobile. A large mass was lying behind it, retroperitoneally in the retrouterine space. There did not appear to be any line of separation between the uterus and the mass, which completely filled the pelvis, was fairly soft to touch, and was not adherent to the bowel. A small incision was made into the tumour, and a clear watery fluid exuded through the opening. By extending the incision, access was given to innumerable small and large hydatid cysts, which were removed. The lining of the cyst consisted of typical hydatid membrane, which was removed with sponge forceps. The cavity was swabbed out with a 40% solution of formalin, and a large rubber drainage tube was placed in the cavity to drain outside the abdomen. The abdominal wound was closed in layers. Convalescence was comparatively uneventful, there being little discharge from the tube, though after removal of the tube a small sinus developed and did not close for six weeks. Several small cysts were extruded from the sinus during this period. An incisional hernia resulted, but was repaired successfully four months after the primary operation.

The patient's general condition improved for a time, and then began, gradually, to retrogress. Expectoration increased, and because of its intermittence the possibility of a pulmonary hydatid cyst was considered; but this could not be substantiated, as at no time was membrane expectorated. The presence of a spreading tuberculous lesion in the right lung, with no radiological evidence of active infection in the left lung, suggested the desirability of some relaxation therapy, and a first-stage (upper) thoracoplasty of three ribs was performed on the right side. Unfortunately, death occurred ten days after the thoracic operation as the result of acute cardiac failure.

#### Autopsy.

Autopsy was performed eight hours after death. When the thorax was opened the right pleural cavity was found to be completely obliterated by pleural adhesions, though the left cavity was normal. There was no evidence of fluid in the peritoneal cavity. There were some omental adhesions to the abdominal scar. In the lower lobe of the right lung was a large, irregular cavity, with shaggy, soft walls, and with several thick and thrombosed blood vessels passing through it. In the upper and middle lobes

were areas of fibrosis and of active tuberculous infiltration, suggesting the presence of old and recent tuberculous infection. The upper lobe of the left lung was mainly fibrotic; but in the lower lobe and at its periphery were several fan-shaped areas of tuberculous mottling which had not been demonstrated radiologically. The heart was dilated and soft; the characters of the cavities, vessels and orifices were within normal limits. The liver was carefully examined and sectioned in layers no more than 1.25 centimetres (half an inch) thick. The gall-bladder and bile-ducts were normal. The liver capsule was perfectly smooth, with no suggestion of scarring, and no puckered or linear scars could be detected in the liver substance, though there was some slight degree of fibrosis. The spleen was normal in size, shape and consistency. No evidence of any intestinal lesion could be found. The mesenteric glands were slightly enlarged. The uterus was freely movable, anteverted and anteфлекed, with a small scar 1.25 centimetres (one-half inch) long on its anterior surface, apparently the result of Caesarean section. Posteriorly, at the region of the *cervix uteri*, an oval, yellow, plaque-like piece of tissue, 1.25 by 1.9 centimetres (one-half inch by three-quarters of an inch) in size, lying in the anterior wall of the pouch of Douglas, marked the former position of the pelvic cyst. There was no macroscopic evidence of hydatid formation in the peritoneum or in the abdominal wall. No evidence of pathological processes could be found in the remaining viscera.

#### Comment.

The features of interest in the case lie in the following: (i) The presence of a primary, retroperitoneal pelvic hydatid in the female; (ii) the progression in size of the cyst over a period of three years; (iii) the degree of healing which followed evacuation of the cyst; (iv) the presence of tuberculous infiltration in the left lung, which was not demonstrable radiologically.

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## Reviews.

### DERMATOLOGY.

IN offering "An Introduction to Dermatology", Dr. E. H. Molesworth has entered a difficult and restricted field.<sup>1</sup> For at least twenty years the physiology and morbid anatomy, both macroscopic and microscopic, of the skin have been well described, and each new text-book must necessarily be to a great extent a copy of its predecessors in this respect. On the other hand, dermatological concepts must expand so rapidly and so extensively to keep in touch with medicine in general, that to cover the field adequately not one volume but a series is necessary.

Molesworth, for reasons given in the preface, has dispensed with coloured plates and has given in their place reference to coloured plates in Jacobi's atlas and Semon's atlas. As he states, one or other of these books is in most medical school libraries or common rooms. A very small percentage of practitioners own these volumes, however.

The photographic illustrations, mostly from Whitfield's "Skin Diseases and their Treatment", are excellent.

The book can be confidently recommended as a notable contribution to modern dermatology, particularly valuable as a guide to conditions essentially Australasian. It has the merit that while antipodean conditions are dealt with in most detail, the author has brought to its making a knowledge and experience that are essentially European.

<sup>1</sup> "An Introduction to Dermatology, with a Chapter on the Theory and Technique of X-Ray and Radium Therapy", by E. H. Molesworth, M.D., Ch.M., with foreword by J. Jadassohn: 1936. London: J. and A. Churchill Limited. Demy 8vo, pp. 536, with illustrations. Price: 25s. net.

The author suitably acknowledges his indebtedness to the teaching of Whitfield and the late Josef Jadassohn—indeed the whole book bears the impress of the former's outlook and methods. The book is easily readable and is as dogmatic as a successful text-book should be.

Among the contents of this volume the chapters dealing with diseases due to fungus infection, with leprosy and with tumours of the skin are of outstanding value.

The article dealing with *acne vulgaris* is a happy combination of original outlook with the influence of the French school of dermatology; it is interesting to find here the facial skin regarded as part of a growing individual rather than as a potential recipient of so many units.

The experience and qualifications of the author as a radiotherapist are sufficiently well known for his pronouncements to be received with respect; his recommendations for radiotherapy are confined to fewer dermatological conditions, and are given with less enthusiasm than is found in several comparatively recent text-books.

It may be useful to indicate briefly points of interest in the book.

Under the heading of papular urticaria of children Molesworth includes prurigo of Hebra, suggesting that the difference seems to be rather one of degree and duration than of nature.

The nervous factors underlying urticaria of adults are not stressed as being important.

For *sycois barba* Molesworth advocates staphylococcal antiviral as a local application before and after epilation. He mentions the use of staphylococcal toxoid, but states that painful reactions after the first two or three injections are apt to deter the patient from continuing this type of treatment. Complete depilation he regards as justifiable after recurrence, provided the patient is informed and willing. No mention is made of quinolor ointment (Squibb), which has proved an inestimable boon in this country as well as in America, particularly in patients whose sycois has recurred after complete but temporary depilation.

Molesworth includes *dermatitis repens* and *acrodermatitis continua* as similar conditions—an opinion not shared by all dermatologists.

On page 124, *Rouget des pores* is a misprint for the translation of swine erysipelas.

In the treatment of impetigo the use of adhesive plaster is not mentioned.

In agminate staphylococcal folliculitis the syndrome acquires a new and second name. "The voice is Jacob's voice, but the hands are the hands of Esau." A useful note is made of the pitfalls of microscopic examination in this condition; a diagnosis of malignant disease may be erroneously arrived at. The use of staphylococcal antiviral and toxoid is recommended.

Molesworth approves of the use of thallium acetate in very young children who are infected with ringworm, and gives directions for suitable precautions against untoward effects.

In his chapter on syphilis his methods of massive doses with intervals differs somewhat from that recently advocated by Stokes, and his outlook is more optimistic than that of the latter.

For *lupus erythematosus* Molesworth displays no great enthusiasm for the use of gold salts, particularly the earlier preparations. He prefers bismuth as a less dangerous drug, but gives directions for the use of "Solganol B Oleosum" for suitable occasions. He does not mention Haxthausen's method of using gold chloride intravenously, or the more recent advocacy of plasmoquine. He advocates, on occasion, the use of small doses of X rays (120 kilovolts with a screen of one millimetre of aluminium and a dose of 150 R) on resistant areas.

For the treatment of naevi he diverges from the usual dermatological practice in preferring X ray to radium therapy. A convincing argument for this preference is advanced.

In a comprehensive chapter on tumours of the skin no mention is made of the condition recently described by MacCormac and Scarff as *molluscum sebaceum*. It may be assumed that in this land of sunshine no tumour of this size or development is to be regarded as innocent.

The extensive use of X rays and radium in the treatment of diseases of the skin has caused Molesworth to include a chapter describing the theory and technique of radiation therapy and the indications for its use. While making no attempt to go very deeply into the physical aspects of radiation treatment, he has nevertheless succeeded in giving a clear and essentially practical picture of the basic principles underlying the use of various types of radiation.

It is believed that skin and tissue reactions are dependent on the amount of radiation absorbed, and not upon the wave-length; the matter of paramount importance is the even distribution of dose throughout the affected volume, and the type of radiation to be used must be chosen to fulfil this condition. The administration over a large skin surface (for example the skull) of a radiation dose sufficient to induce epilation without impairing the regrowth of hair frequently presents difficulties. Various methods of obtaining a more or less uniform skin dosage are described, including a novel technique developed by the author, which would appear to have certain advantages.

The author discusses the relative advantages of various radium and X ray techniques (including the application of the *Grenzstrahlen* of Bucky and the contact therapy of Chaoul); this latter method should perhaps be more correctly regarded as using radiation equivalent to that from lightly filtered radium at a distance rather than that from a plaque. In a specially contributed section, Dr. H. M. Moran outlines the general principles of the treatment of skin carcinoma by the radium plaque, interstitial radium and radium mould, and includes valuable general information regarding the most suitable screenage of radium, its distribution to obtain a uniform dosage, and the dosages necessary for various reactions.

Molesworth ranks X rays and radium as highly poisonous drugs, and urges their administration with an exactness equal to that observed in the use of drugs. A detailed account is given of the practical methods of determining both the dosage and quality of the X rays used under varying conditions; in particular the pastille and ionization methods of measuring dosage are critically compared, and the necessity for periodical standardization of dosimeters is stressed. A valuable section deals with the treatment of X ray burns and the precautions to be taken with patients who have been given a maximum tolerated dose.

The entire chapter has been written from the standpoint of practical experience, and full details are given of the various equipments used. The author is to be commended for including this simple but accurate presentation of the problems of radiation therapy in a dermatological text-book.

To conclude: this book is admirably suited as a guide to the practitioner. For the dermatologist of this or other countries it provides a well-written and interesting summary. The paper, print and illustrations are excellent.

#### INTESTINAL ABSORPTION.

In his monograph on "Absorption from the Intestine", Professor F. Verzar has produced, with the assistance of E. J. McDougall, Ph.D., a comprehensive survey of a most important branch of physiology.<sup>1</sup>

The work is largely, but by no means exclusively, a review of the researches which have been in progress for a number of years in the senior author's laboratory. The opportunity is taken to review the conclusions to which this and other contemporary work has led.

The main problem underlying all this work has been the question whether physico-chemical processes are sufficient to account for the known facts with regard to absorption from the intestine. The authors have paid special attention, both in their researches and their discussion, to those phenomena of absorption which do not

<sup>1</sup> "Absorption from the Intestine", by Professor F. Verzar, assisted by E. J. McDougall, Ph.D.; 1936. London: Longmans, Green and Company. Medium 8vo, pp. 305, with 70 illustrations, many of which are in colour. Price: 21s. net.

at first sight appear explicable as the result of physical or chemical processes.

The general conclusion reached is that although the living epithelium undoubtedly modifies the rate of passage of substances through it, no evidence has been adduced to show that the movement is due to any forces other than physical, the chief of which is diffusion. Every anomalous case of absorption which has been investigated has yielded a simple explanation in physical or chemical terms. For example, glucose and galactose disappear from the intestine at rates far in excess of those which could be explained by diffusion and which are observed in other simple sugars. Glucose and galactose, however, practically disappear in the intestinal epithelium owing to a reaction by which they form hexosephosphates. The actual diffusion gradient of these sugars is thus much higher than the apparent figure, and adequately explains their more rapid passage out of the intestine.

The apparently anomalous behaviour of the fats is also discussed in considerable detail. Their absorption is shown to take place entirely by diffusion as glycerol and as diffusible compounds between the fatty acids and the bile acids. The soluble soaps appear to play no part in the process.

The importance of the movements of the villi in accelerating absorption from the intestine is dealt with in considerable detail.

The authors show also that many apparent anomalies occur in the diffusion of mixtures of substances across artificial membranes. These apparent anomalies are explained by the different rates of passage of the different substances across the membrane. They disappear when sufficient time is allowed for the attainment of equilibrium.

The mechanism of absorption from the large intestine appears to be quite different from that which holds for the small intestine. By the time the contents reach the large intestine they are very close to osmotic equilibrium with the body circulating fluids. Absorption by diffusion from such a solution should be very slight, and yet considerable quantities of liquid disappear from the bowel.

The authors present evidence to show that absorption from the bowel is due, not to diffusion, but to a filtration resulting from the mechanical pressure exerted upon its contents. Possibly variations of the tonicity of this organ may account for the somewhat conflicting statements with regard to absorption from nutrient enemata.

The absorption of indiffusible and particulate material from the intestine is discussed; it is considered to be practically negligible under normal conditions. Such small quantities of Indian ink particles or starch granules, for example, which can cross the undamaged epithelium may be due to imperfections in the membrane. The evidence on the site of passage of materials across the intestinal epithelium seems to show that this takes place exclusively through the cells, and that the material passing by intercellular routes is negligible in amount.

The monograph is well illustrated and may be recommended as a fascinating and authoritative account of existing knowledge of the processes of absorption from the intestine. A copious bibliography is given.

#### TISSUE IMMUNITY.

In his recent book on "Tissue Immunity" Dr. Reuben Kahn has presented the results of his own researches, but has not made any attempt to review critically all the available evidence on this subject.<sup>1</sup> Consequently there is a bibliography of only forty-six references.

The author has devised an ingenious method and has exploited it in all possible permutations in these studies. He has determined the amount of antitoxin necessary to give protection against a fixed dose of diphtheria toxin, when the latter is injected into the skin and the former into the blood or into various tissues. In animals not previously treated with horse serum the amount of antitoxin necessary to neutralize 50 minimum lethal doses of toxin ranges between five units (injected into the blood stream)

and twenty units (injected into the skin). In animals, which had earlier received an injection of horse serum, from fifty to seventy-five units were necessary to give protection when injected intravenously; but 1,000 to 1,500 were necessary when injected into the skin, and intermediate amounts in other tissues. This is due to the blinding effect of the immunized tissues upon the horse serum proteins of the antitoxin, and this "anchoring" effect is regarded as a preliminary to the destruction of these specific antigens by the local inflammatory reaction caused by their presence in actively immune animals.

Dr. Kahn has used this method to study the immunity of the various body tissues, in the period of incubation, when immunity is fully developed, when active immunity is subsiding, in the "disimmune" or desensitized state, and in passive immunity. He regards the capacity possessed by immune tissues of thus anchoring the specific antigen as a quality acquired by the tissues themselves, but does not provide evidence against the much more probable view that tissue immunity is in reality dependent upon the presence of humoral antibody in the tissue spaces. Many other aspects of immunity are discussed—natural immunity, non-specific reaction and the tissue necrosis which may result in immune tissues when an inflammatory reaction is in progress if excess of antigen is simultaneously present.

The discussions on the practical and clinical considerations in regard to immunity are of particular interest. Of especial value are the summaries at the end of each chapter.

The work is copiously documented with tables and charts which facilitate a critical survey of the author's own results; but in our opinion the book would be both more useful and more stimulating if it was reduced to a half or a third of its length and if the general argument were stated with reference to the author's own already published works for details of experiments.

#### "SCALPEL AND SWORD."

SIR JAMES ELLIOTT, a New Zealand surgeon, is to be congratulated upon his book, "Scalpel and Sword". The volume admits him into the circle in which dwell Crichton Browne, Halliday Sutherland, Bland Sutton and other gifted doctor-writers. Sir James's book begins with the account of his early days in the rambling Wellington of the eighties, and deals later with his professional training at Otago and Edinburgh. In Scotland, Sir James was the student of such bygone notabilities as Crum Brown, Schafer, Rutherford, Chien and Sir William Turner; and as he has a flair for anecdote, he tells many a good story of his old teachers.

Sir James served as a young man in the South African War, and graphically describes the discomforts and dangers of that ill-advised campaign. In particular, his pen-picture of the Magersfontein catastrophe is writing of a very high level. During the Great War, Elliott found scope for his surgical skill in the *Maheua*, which had been converted by the New Zealand Government into a hospital ship. This beautiful little vessel, a former trans-Tasman flier known to thousands of travellers by sea, performed much of her war-time service in the carriage of wounded from the western front across the Channel to England—a perilous traffic indeed. Sir James plainly reveals a love for his old ship, as all must who have travelled in her.

The book's value is enhanced by chapters dealing with the writer's professional experiences and by the account of his travels in America and elsewhere. Perhaps best of all are the chapters descriptive of New Zealand scenery and of Maori religious beliefs and legends. The author has the deepest affection for his lovely country; his pages on its birds, trees, mountains and glaciers, as well as those on the noble Maori race, have a charming sincerity which lingers in the mind when the book is closed. It would be pleasant to read something more from Sir James Elliott's pen.

<sup>1</sup> "Tissue Immunity", by R. L. Kahn, M.S., D.Sc.; 1936. London: Baillière, Tindall and Cox. Royal 8vo, pp. 727, with illustrations. Price: 34s. net.

<sup>1</sup> "Scalpel and Sword", by Sir James Elliott, M.D.; 1936. Australia: Angus and Robertson Limited. Demy 8vo, pp. 215. Price: 7s. 6d. net.

## The Medical Journal of Australia

SATURDAY, APRIL 10, 1937.

All articles submitted for publication in this journal should be typed with double or treble spacing. Carbon copies should not be sent. Authors are requested to avoid the use of abbreviations and not to underline either words or phrases.

References to articles and books should be carefully checked. In a reference the following information should be given without abbreviation: Initials of author, surname of author, full title of article, name of journal, volume, full date (month, day and year), number of the first page of the article. If a reference is made to an abstract of a paper, the name of the original journal, together with that of the journal in which the abstract has appeared, should be given with full date in each instance.

Authors who are not accustomed to preparing drawings or photographic prints for reproduction, are invited to seek the advice of the Editor.

### DISCUSSIONS AT BRANCH MEETINGS.

At a recent meeting of one of the Branches of the British Medical Association a speaker protested that, while it was salutary to remember certain purely scientific aspects of a subject (these he mentioned), the function of debates at Branch meetings was to serve as a guide to men in practice. From this point of view he thought that the more simple the lesson sent forth, the more likely was it to be absorbed. In certain quarters approval has been given to this expression of opinion, and the occasion has therefore seemed to justify reference to the object of Branch meetings and their discussions.

Branch meetings may be considered from the point of view of the subjects discussed and of those who attend. The primary object of the British Medical Association is the study of the medical sciences, and this must never be forgotten. If the programme of the meetings of any of the six Australian Branches for a twelve-month period is examined, it will be found that the range of subjects is generally wide. Attention is paid to sectional interests, and few can be justified in

complaining that nothing to interest them is ever brought forward. If we may judge from criticisms and complaints that are sometimes heard, members who pay any attention to Branch meetings are of three kinds. There is the scientifically minded reader—it might be to the advantage of the Association if those of his kind were more numerous—who complains that what is discussed is generally what everyone knows, and that its publication is the waste of so much paper and ink. There is the average reader who uses Branch meetings and their discussions as a means of keeping himself informed of the trend of work and thought on the many subjects about which he feels he ought to know something. There is what we may call the rule-of-thumb reader, who is not satisfied unless he is told that he must do so-and-so in this or that condition, and who does not concern himself very much with the why and the wherefore. We may ignore the member who grumbles and complains in spite of any effort that is made for him. Readers of all three kinds sometimes forget that meetings are not always held with the same objective. Occasionally a member is able to bring forward a piece of original work, the result of long and patient investigation; more often, however, the speakers (those who read papers) have been asked to introduce a discussion on new work that has been carried out elsewhere, and they talk about it in the light of their own experience. It sometimes happens that the subject chosen is by no means new, and in these circumstances, unless great care is taken, the opening papers degenerate into a description like that found in any text-book, except that the text-book description will as a rule be more attractively worded. Attendance at a Branch meeting may be small or large. It is a mistake to think of the audience only in terms of those present at the meeting. Five thousand copies of this journal are printed every week, and what members have to say is widely broadcast. Probably this fact called forth the protest mentioned at the beginning of this article.

What is needed in Branch meetings is a proper appreciation of the object of each discussion. The title of a paper should be an indication of its

nature. If a general subject is chosen, a speaker should make some attempt to cover the subject and should not select one of its aspects so that he may ride his own hobby horse to his own delectation and the possible boredom of some of his audience. Discussion of a general subject becomes difficult if only one or two aspects have been emphasized in the opening paper or papers. Again, if a member undertakes (and we are often much indebted to those who do undertake) to prepare a paper that is intended to be a *résumé* of present-day knowledge, he should take just as much trouble with it as if he were preparing an account of his own original work. Anyone can write a paper with the aid of text-books, but a man who has been in practice for years should be able from his experience to adorn his text-book-like story so that it will be not only attractive, but useful. If he is not able to do this, he should not undertake the writing of a paper. Lastly, the chairman of a meeting should see that discussion is germane to the subject. In what is germane we should always be willing to include purely scientific facts that may throw light on the subject, even though critics may not include them in what is to serve as a guide to men in practice.

### Current Comment.

#### FACTORS IN THE PRODUCTION AND CURE OF MACROCYTIC ANÆMIAS.

"MARMITE" and similar autolyzed preparations of yeast have been known for some time to exert a curative action in tropical and other macrocytic anæmias in which there is scanty evidence of any alteration in the gastric juice; the fact is also established that they are hæmopoietically active in pernicious anæmia after a period of incubation with healthy gastric secretion. Castle has therefore advanced the theory that a hæmopoietic liver principle is formed by the interaction of an intrinsic factor present in normal gastric juice with an extrinsic factor to be found in certain foods. Lucy Wills, P. W. Clutterbuck and Barbara D. F. Evans<sup>1</sup> point out, indeed, that this liver principle has recently been isolated in relatively pure form by Dakin and West and given the name of an hæmin; but an hæmin is alleged to bear little similarity, from the chemical point of view, to the liver factor, curative in pernicious anæmia, which has been

isolated by McMeekin, Cohn and Minot. Since Castle's extrinsic factor is found in abundance in autolyzed yeast, it may well be that this principle, so valuable for the treatment of tropical macrocytic anæmia, corresponds to the extrinsic factor essential for the cure of pernicious anæmia, and that tropical macrocytic anæmia may therefore be essentially a deficiency disease resulting from a lack of this extrinsic factor in the diet.

It is likely that two hæmopoietic factors are to be found in extracts of autolyzed yeast, liver and wheat germ, all of which are active both in the pernicious anæmia of man and in the macrocytic anæmia found in the rhesus monkey. Although monkeys apparently require the liver principle contained in an hæmin, there is good ground for suggesting that the anæmia under discussion is not the result of a mere lack of this factor and cannot be due alone to the want of Castle's extrinsic factor. The anæmia of the rhesus monkey seems to be due, in part at least, to the lack of some other factor as yet unidentified.

Two active factors have now been isolated from the liver extract known as "Campolon", the one soluble in saturated ammonium sulphate and the other not. The soluble fraction is curative of the macrocytic anæmia of rhesus when administered parenterally. The insoluble factor, which contains an hæmin, is quite inactive in the treatment of this anæmia, as also are commercial preparations of an hæmin; but it is curative of pernicious anæmia.

By treatment with alcohol of acidulated aqueous yeast extracts, two separate fractions have been recovered, of which one, the insoluble, is inactive in monkey anæmia, while the soluble is curative. Evidence shows that both factors are essential for hæmopoiesis in both man and monkey, but that the soluble one is mainly concerned in the cure of the nutritional anæmia in the monkey. It would also seem that both factors must be contained in those liver, yeast and wheat germ extracts which are potent, either separately or mixed with gastric juice, in both pernicious anæmia and that of the rhesus monkey.

#### ROUTINE PURGATION.

IN the opinion of L. J. Witts,<sup>1</sup> the routine administration of purgatives of all kinds to hospital patients rests mainly on long-established custom and is a practice which is open to grave criticism. Resident medical officers soon fall into the habit of prescribing "ward aperients and enemata" for all patients in their charge as a matter of routine, and the young house surgeon is a brave man who dares to countermand a dose of some purgative when the drug has been suggested as necessary by an experienced ward sister. Nurses, like most women, are creatures of convention, and in nothing more so than in the details surrounding the ritual of defæcation.

<sup>1</sup> The Lancet, February 6, 1937.

<sup>1</sup> The Lancet, February 20, 1937.

The majority of acute ailments cause dehydration of tissues, resulting in constipation; in other words, constipation is the result, not the cause, of the illness. Further, toxins are in general neither excreted nor absorbed through the intestinal wall, and toxæmic states are more often the result of diarrhoea than of constipation. The use of drastic purgatives, besides being productive of physical exhaustion, leads directly to dehydration and frequently to an irritative gastro-enteritis. Purgative medicines undoubtedly perform a useful function as eliminants in cases of acute bacterial infections of the alimentary canal, as also in states of heightened intracranial pressure in which dehydration must be deliberately secured. These are special cases calling for special treatment. These indications apart, patients suffering from acute affections should not be given routine doses of purgative medicine. In such illnesses, the necessity for the bowels to act is rarely a matter of urgency and, contrary to the common belief, a delay of several days is rarely harmful. Under these conditions, the retained faeces may be softened by the giving of liquid paraffin, and their expulsion aided by the use of enemata. Constipation has long held a sinister reputation as a potent cause of meteorism; the real truth, according to Witts, is that meteorism is commonly the result of the overhandling and infection of the gut during surgical operations. There are diseases, such as thyrotoxicosis and Addison's disease, in which diarrhoea is a common symptom, and in which, therefore, dehydration commonly occurs. In these diseases aperient drugs are a real peril. Modern physiology and pharmacology have shown that the exhibition of Epsom salts or even of bicarbonate of soda under unfavourable conditions may cause death.

Not many years ago the doctrine was widely held that constipation caused melancholia, mastitis, foul breath, foul sweats, high blood pressure and low blood pressure, and that these disorders might be relieved or cured by soliciting copious actions of the bowel. Fortunately for thousands of patients, this view has suffered a well-deserved loss of popularity.

Although there is no law, natural or statutory, that the human bowel should expel its contents once or twice daily, we must admit that such is the common rhythm. In states of ill-health this rhythm is easily upset, a derangement which is accentuated too often by too long a sojourn in bed. An intestinal dysfunction is increased by the use of the bed-pan. It is difficult to suggest anything to replace this appliance, which in its very shape and all its associations appears revolting.

The administration of cathartics, in the present state of physiology and pharmacology, is governed, or may be governed, by sound scientific principles. It would not appear, however, that there is any established rule for the giving of such drugs in serious post-operative states, particularly in the field of gastric surgery. At the same time, that opinions are changing in the province of pure medi-

cine will be understood from the statement that the forthcoming edition of Price's "Medicine" will discountenance the use of purgative medicines in uræmia. For the reason that acidosis and alkalosis both result in dehydration, it is more than likely that the same prohibition will shortly apply to comatose conditions associated with diabetes.

#### BLACKWATER FEVER.

THE aetiology of blackwater fever remains unsolved. It is now more or less generally accepted that malarial infection is a necessary precursor to the disease; but it is not known how malaria causes the hæmoglobinuria, if indeed it does so. There are many interesting theories. For example: that great authority, Patrick Manson, expressed the opinion that there was a specific cause (not malaria); more recently it has been suggested that there may be particular strains of plasmodium capable of producing great hæmolysis. Strong arguments against both these theories arise from recent work carried out by Henry Foy and Athena Kondi at the League of Nations Malaria Research Laboratory, Salonika.<sup>1</sup> They inoculated 106 patients suffering from general paralysis or other mental disorder, with blood from 58 patients suffering from blackwater fever in various stages. In no case did the inoculation result in blackwater fever. Anopheles were fed on the blood of 35 patients suffering from blackwater fever, and after a suitable period of incubation were allowed to feed on 68 persons suffering from general paralysis. In this series also no inoculated person suffered from blackwater fever. In all cases observation was continued over a period varying from nine to eighteen months after inoculation. The appearances of the blood in blackwater fever varied considerably. In some cases there was a very heavy infection of *Plasmodium vivax* or *Plasmodium falciparum* or both; in other cases the infection was light; in others no parasites were found. Foy and Kondi suggest that the results of their study "limit the field of argument for the existence of hæmolytic strains of malaria and/or other specific parasites concerned in the genesis of blackwater fever..." This is a cautious statement; they might be pardoned for expressing the opinion that the specific theory and the theory of hæmolytic strains of plasmodia have been disproved. If the particular strain of parasite was the cause of blackwater fever, surely it must have reproduced the disease in at least one of all these many experiments. Surely also, if there was a specific organism in the blood, it must have been transmitted in the vast majority of cases and have reproduced the disease in one or two. The only possible answer to this argument seems to be that persons susceptible to blackwater fever are very rare and that among those studied by Foy and Kondi, none happened to be susceptible.

<sup>1</sup> *Annals of Tropical Medicine and Parasitology*, December 23, 1936.

## Abstracts from Current Medical Literature.

### BACTERIOLOGY AND IMMUNOLOGY.

#### Studies on Inflammation.

VALY MENKIN (*Journal of Experimental Medicine*, July, 1936) has studied the mechanism of increased capillary permeability and has made a critique of the histamine hypothesis. Noting that inflammatory changes are initiated by a disturbance in local fluid exchange, and that direct endothelial injury as well as axone reflex may be involved, the author studied these first two factors. In earlier experiments it had been noted that increase in capillary permeability was readily demonstrable by the accumulation of a dye from the circulation in the affected area; this method was applied to the study of inflammatory exudates, precipitates and dialysates therefrom, the precipitating agents, and histamine. Exudates were obtained from the thoracic cavities of dogs and rabbits, and from rabbit skin by infection and by blistering. Having injected 0.2 cubic centimetre of cell-free exudate into the normal skin of rabbits, the author followed this by the injection of 10 to 15 cubic centimetres of 1% trypan blue in normal saline solution into the ear vein of the same animal. The treated cutaneous area stained intensely and homogeneously; the staining commenced in from one to three minutes and was complete in from ten to fifteen minutes. Serum from the same animal caused only a very small peripheral staining of the area, and sometimes none at all. The precipitate obtained from treating exudate with saturated ammonium sulphate, redissolved in saline solution, water or buffer solution, produced increase in capillary filtration by prompt accumulation of trypan blue, while the buffer solution, saline solution or water alone produced no staining. The globulin fraction of the exudate salted out proved to be inactive. The albumin fraction, remaining after dialysis, redissolved and injected, also produced a negative result. The dialysate, on the other hand, concentrated to a small volume, or evaporated to a crystalline mass, and alkaline to phenol red, when redissolved and injected intradermally, caused an accumulation of trypan blue, thus demonstrating increased permeability of capillaries. Varying doses of histamine were dissolved in 0.2 cubic centimetre of fluid and injected intradermally, and this was followed by the intravenous injection of trypan blue. The dye usually failed to enter the injected area, and sometimes accumulated in a flare pattern at the periphery of the injection. A mixture of histamine with a proven active cell-free exudate failed to cause staining on injection. The effect of exudate on the isolated guinea-pig

intestine was to depress its tonus. The addition of histamine to the same preparation caused powerful contractions; so that the two effects were entirely dissimilar. These results were recorded on the revolving kymograph. Finally a human exudate was used for similar experiments, and identical results were recorded in staining of the rabbit skin, and on the guinea-pig intestine. The factor which induced increased capillary permeability was found to be crystalline, protein-free, heat-stable, precipitable with the albumin fraction, but dialysable from it; it was distinct in all its action from histamine. The studies on this crystalline material are being continued.

#### Trichomonas Vaginalis.

H. A. SHELANSKI (*Journal of Laboratory and Clinical Medicine*, May, 1936) has published part of an investigation into methods of culturing and controlling species of *Trichomonas*. A strain from a typical case of trichomonas vaginitis was isolated by collecting the discharge and emulsifying it in five cubic centimetres of number 2 Ringer's solution. One cubic centimetre was then sown into ten cubic centimetres of a medium containing 0.1% Löffer's blood serum in Ringer's solution number 2 and incubated for forty-eight hours at 37° C. This ten or eleven cubic centimetres of culture was then inoculated into 500 cubic centimetres of the same medium and again incubated for forty-eight hours at 37° C. The organisms were present in concentration of 750 per cubic centimetre, and remained alive, motile and of typical form for one week. The actions of four dilutions of silver proteinate and inorganic salts were then tested in five cubic centimetre amounts on equal quantities of the culture, and the time to kill the organism was noted. Three samples of each dilution were tested. Silver picrate was found to be lethal at a lower concentration and in shorter time than silver nitrate.

#### Hæmolytic Streptococci.

L. J. DAVIS AND J. S. GUDZAR (*The Journal of Pathology and Bacteriology*, July, 1936) have continued their studies on the serological and biochemical reactions of strains of streptococci isolated from the throats of 788 Hong-Kong Chinese during the winter of 1935-1936. The hæmolysis test on rabbit blood was the criterion on which strains were selected for further study; 8.1% were positive. The Lancefield precipitin method was used for grouping, and then five carbohydrates were used for fermentations; the pH in nutrient broth, the activity on human fibrin, the reduction of methylene blue milk were determined, and finally the production of toxin in trypsin digest broth was tested on one of the authors, who was a Dick-positive subject. The results showed that 28 strains were of Lancefield's Group A, 23 were of Group C, and 27 of Group G. Ten

strains in Groups C and G gave cross-reactions; all the other reactions were clear-cut. No useful differentiation was found in the carbohydrate fermentations, and all the strains caused lysis of human fibrin. All the pH estimations in Group A were above 4.2, but the variations in all groups were comparatively small. In the methylene blue milk no Group A strain effected reduction, while the great majority of the others produced reduction. In the erythema skin reactions the Group A strains all produced more than five millimetres of redness, while the majority of the others gave no reactions whatever, or only minute reactions. The general conclusion was formed that only the Group A strains produce erythrogenic toxin, while the Group C and G strains resemble certain types of animal origin described by other authors. The carrier rate of Group A streptococci in Hong-Kong Chinese is approximately 3%.

#### The Bactericidal Effect of Human Serum on Hæmolytic Streptococci.

W. S. TILLET (*Journal of Experimental Medicine*, January, 1937) has made a series of observations on the bactericidal effect of human serum against three strains of hæmolytic streptococci. Sera were obtained from twenty-five patients suffering from various acute infections at varying stages of illness and convalescence. These were tested against each of three strains, one known to be susceptible, one old resistant laboratory strain, and one intermediate in resistance. Controls were first performed with sera from twenty-five normal persons, and these were found after forty-eight hours' incubation to exert no bactericidal effect whatever on the three strains selected. The sera from thirteen patients with pneumonia all exhibited extensive and frequently complete destruction of the streptococci of two strains, and partial destruction of the resistant strain. As soon as the patients became afebrile the serum became inert. A variety of other infections yielded sera of similar potency in the acute stages, and similar loss of activity when the patient became afebrile. Finally, sera from patients with malaria induced for therapeutic reasons were tested. Although the temperatures were higher, the bactericidal action, though present, was not so complete as that exhibited by sera from patients with other fevers. When tested between rigors, the serum was still active, but became inert after defervescence had been produced with quinine therapy. It was ascertained that there was no superficial correlation between the number of leucocytes in the circulating blood and the bactericidal action of the serum, but there did seem to be some association between the height of the temperature and the bactericidal action. The sera of greatest killing power seemed to come from those patients whose illness was most severe.

## HYGIENE.

## Observations from an Epidemic of Acute Poliomyelitis in Greenland.

KAI HOLVY (*Canadian Public Health Journal*, December, 1936) states that the Sukkertoppen district in Greenland has a population of 1,363 Greenlanders and the Holsteinborg district 876. They are isolated coastal communities. In 1914 an epidemic in Sukkertoppen caused 37 deaths from poliomyelitis among 700 persons. No cases are recorded anywhere in Greenland since 1925. In the two districts in 1932, 83 cases occurred with 20 deaths—27 patients were severely paralysed, 17 slightly paralysed, and 17 had no paralysis. No person who had gone through the 1914 epidemic developed the disease in 1932. Very thorough isolation of the villages affected was practised with apparent success. Many complained of headache and indisposition, others (children) of a little fever for two or three days. The author regards these as abortive cases and with carriers as forming the main spread lasting weeks. The early cases tended to be the most serious. Infection from actual cases was insignificant. The author considers six weeks quarantine of contacts more effective than three weeks.

## Active Immunization Against Whooping Cough.

J. A. DOULL, G. S. SHIRLEY AND J. E. McCLELLAND (*American Journal of Public Health*, November, 1936) state that recent favourable reports have revived interest in active immunization against whooping cough. The *S* and not the *R* form of *Haemophilus pertussis* is effective. Madsen's observation in the Faroe Islands suggests that a rapid development of immunity after inoculation and a drop in severity rather than total prevention are to be expected. In Baltimore 8% to 10% of children suffer from the disease between the ages of six and eighteen months. In Cleveland, 483 children at this age received the vaccine and were observed for the succeeding nine months. Health nurses visited the homes, physicians notified cases of the disease, and 496 children of similar ages in the same area were observed as controls. Among the inoculated, 61 attacks were noted as against 71 in the controls. Physicians report the attack in the inoculated as milder; the only death was that of a control.

## Immunization of New-Born Infants to Tetanus Neonatorum.

C. N. LEACH, S. H. ZIA AND KHA-TI LIM (*American Journal of Hygiene*, September, 1936) state that in many villages of rural China *tetanus neonatorum* causes death in 15% to 20% of the new-born during the first month of life. Seventy-one normal pregnant mothers attending the ante-

natal clinic in Peiping were injected with tetanus formol toxoid, one to five cubic centimetres being given in one to three injections spaced at eight weeks, four weeks and two weeks in series. Local reactions were mild, general reactions absent. Blood samples were obtained by venipuncture from the mother and by milking the cord of the new-born. The blood of newly born infants whose mothers had received no toxoid did not protect mice against two minimal lethal doses, and few against one minimal lethal dose. One unit of tetanus antitoxin was taken as neutralizing 1,000 minimal lethal doses (death of mice in 64 to 72 hours). With two or less injections of toxoid the average titre of antitoxin was ten for the mother and one for the new-born. With three injections (43 mothers) the maternal titre was 27 and the new-born titre was 13.8, roughly one-half the mother's titre. The serum of infants was tested 45 to 157 days after birth. Considerably lower figures usually were found up to 120 days, after which the serum antitoxin had disappeared. The method, however, gives obvious possibilities for protection of the new-born.

## Epidemiology and Symptomatology of Staphylococcus Food Poisoning.

GEORGE A. DENISON (*American Journal of Public Health* and *The Nation's Health*, Volume XXVI, 1936, page 1168) states that food poisoning due to staphylococci was first reported by Barber in 1914. At the present time eighteen outbreaks have been recorded in which the offending staphylococci were shown to be toxic for man or monkey. The determination was made by the ingestion of milk or broth cultures in three instances and by the ingestion of filtrates in fifteen. The incriminated foods have been cake and custard-filled or cream-filled bakery goods in ten outbreaks, and raw milk in four, while cheese, chicken gravy, chicken salad and tongue sandwiches were each responsible for a single outbreak. In addition, there remains a significant number of food poisoning outbreaks in which staphylococci were thought, for good reasons, to have been the aetiological factor, though full confirmation is lacking. The symptoms, with their variations, are summarized as follows. The most common interval between eating and the onset of illness was three hours. Eighty per centum of patients were ill by the fourth hour, while in a small number the onset was delayed for six, seven and eight hours. Twenty-one per centum were ill only for the short period of one to four hours, while in 36% recovery was delayed for twenty-five to forty-eight hours. Vomiting was the most pronounced symptom, and in 50% was described as continuous. In the majority of cases (92%), however, vomiting had ceased within five to eight hours. There was severe vomiting in 78.2%, severe abdominal

pains in 62.5%, mild diarrhoea (one to seven stools) in 72.8%, mild and usually transient headache in 58%, mild muscular cramps in 51.3%, and sweating in 67%. Prostration, dehydration and the degree of shock varied accordingly. The author concludes by considering methods for the control of such outbreaks, and quotes authorities to show that the organisms in broth culture are destroyed by exposure to 80° C. for fifteen minutes, and that 2,500,000 staphylococci per cubic centimetre of liquid custard were killed by cooking at 85° C. for ten minutes.

## Duration of Schick Immunity.

D. T. FRASER AND K. F. BRANDON (*Canadian Public Health Journal*, Volume XXVII, 1936, page 597) have made a study to find the duration of the Schick immunity conferred by three doses of diphtheria toxoid. More than 34% of the children who had received three doses of toxoid five years previously were found to react to the Schick test. Although the numbers in this group are small, this proportion of Schick reactions five years after three doses of toxoid has been confirmed by unpublished work of Fraser and Young in Toronto, who have carried out Schick tests on a large number of school children at various intervals after toxoid administration. If the Schick test is the criterion of immunity to diphtheria, then one-third of these children have lost their immunity within five years. It may be argued that a positive result to a Schick test is not evidence of susceptibility, since it only shows whether the person has more or less than one two-hundred-and-fiftieth of a unit of antitoxin. Further, it may be maintained that these children with a Schick-positive reaction have had their primary stimulus (diphtheria antigen) and thus may rapidly produce antitoxin in the event of a diphtheria infection, and in this way avert a clinical attack of diphtheria. On the other hand, experience has shown that some children who have had three doses of toxoid do get diphtheria. It is evident that certain children of this group have lost at least one kind of measurable immunity (diphtheria antitoxin), as assessed by the Schick test. It is desirable to maintain children in the "Schick-negative" state, which is widely accepted as indicating a resistance to clinical diphtheria. Recent results (unpublished) obtained by the Health Department of the City of Toronto indicate that children reacting to the Schick test two or more years after receiving three doses of toxoid are rendered "Schick-negative" in a very high proportion of cases one month after one additional dose of toxoid. It would be a rational and effective procedure in pre-school children who have had three doses of toxoid, to give one cubic centimetre of toxoid at the age of entering school. This practice is contemplated as a routine procedure in the schools of Toronto.

## British Medical Association News.

### ANNUAL MEETING.

THE annual meeting of the New South Wales Branch of the British Medical Association was held at the Robert H. Todd Assembly Hall, British Medical Association House, 135, Macquarie Street, Sydney, on March 18, 1937, Dr. E. H. M. STEPHEN, the President, in the chair.

### ANNUAL REPORT OF COUNCIL.

On the motion of Dr. A. M. Davidson, seconded by Dr. K. S. M. Brown, the annual report of the Council was received. The report is as follows.

### Membership.

The membership of the Branch is now 1,679, as against 1,661 at the date of the last report. The additions have included 65 elections, re-elections and resumptions, and 20 removals into the area of the Branch; while the losses have included 8 by resignation, 25 removals out of the area of the Branch, 17 by default in payment of subscription, and 17 by death. The losses by death were as follows: Dr. H. K. Houston, Dr. J. H. Saunders, Dr. J. S. Purdy, Dr. J. J. F. Bourke, Dr. M. Fitzgerald, Dr. R. M. McMaster, Dr. R. Martin, Dr. J. Relach, Dr. J. M. Alcorn, Dr. J. H. Phipps, Dr. J. L. T. Isbister, Dr. J. W. Gormley, Dr. S. H. Harris, Dr. A. C. Owen, Dr. W. Seldon, Dr. R. Balls.

### Meetings.

Nine ordinary meetings of the Branch (including the annual general meeting) and eight clinical meetings were held. The average attendance was sixty-one. Eight of the ordinary meetings, as follows, were held in conjunction with meetings of Sections, namely: April 30, with the Section of Medicine and the Section of Radiology; May 23, with the Section of Neurology and Psychiatry; June 25, with the Section of Paediatrics, the Section of Oto-Rhino-Laryngology and the Section of Anaesthesia; July 30, with the Section of Orthopaedics and the Section of Medicine; August 27, with the Section of Medicine and the Section of Pathology and Bacteriology; September 24, with the Section of Pathology and Bacteriology and the Section of Surgery; October 29, with the Section of Surgery and the Section of Orthopaedics; November 26, with the Section of Obstetrics and Gynaecology. The clinical meetings were held at the Royal Alexandra Hospital for Children, the Royal Prince Alfred Hospital, the Royal North Shore Hospital, the Women's Hospital, Crown Street, Lewisham Hospital, Saint Vincent's Hospital, Sydney Hospital and the Renwick Hospital for Infants. The business of the meetings included thirteen papers and addresses and numerous reports of cases, exhibits and demonstrations. An invitation was extended to the fifth and sixth year medical students of the University of Sydney to attend the ordinary and clinical meetings of the Branch.

### Representatives.

The Branch was represented as follows:

- (a) Council of the British Medical Association (1936-1937): Professor R. J. A. Berry.
- (b) Representative Body of the British Medical Association (1936-1937): Dr. J. G. Hunter.
- (c) 104th annual meeting, British Medical Association, Oxford, 1936: Delegates: Dr. W. K. Inglis, Dr. B. T. Edye.
- (d) Federal Council of the British Medical Association in Australia: Dr. George Bell, O.B.E., Dr. A. J. Collins, D.S.O., M.C.
- (e) Australasian Medical Publishing Company, Limited: Dr. T. W. Lipscomb, Dr. F. P. Sandes, Dr. A. M. Davidson.
- (f) Metropolitan Hospitals Contribution Fund of New South Wales: Dr. R. V. Graham.

- (g) St. John Ambulance Association: Dr. E. H. M. Stephen.
- (h) Executive Committee of the Council for Mental Hygiene for New South Wales: Dr. C. K. Parkinson.
- (i) Board of Control of the Campaign against Tuberculosis: Dr. A. S. Walker.
- (j) Council of the Royal Society for the Welfare of Mothers and Babies: Dr. R. B. Wade, Dr. E. H. M. Stephen.
- (k) Council of the Bush Nursing Association (1936-1937): Dr. E. H. M. Stephen.
- (l) Council of Education: Dr. A. J. Collins.
- (m) Seventh Australian Cancer Conference, May 4 to 8, 1936: Dr. F. P. Sandes.
- (n) New South Wales Post-Graduate Committee in Medicine: Professor W. K. Inglis, Dr. L. W. Dunlop.
- (o) Provisional Council for the Institute of Almoners: Dr. W. Vickers.
- (p) Institution Supplies Committee, Standards Association of Australia: Dr. S. W. G. Ratcliff.
- (q) Ophthalmic Association Limited: Dr. R. B. North.
- (r) Medical Officers' Relief Fund (Federal), Local Committee of Management for New South Wales: Dr. E. H. M. Stephen, Dr. A. M. Davidson, Dr. A. J. Collins.
- (s) New Education Fellowship International Conference: Dr. E. H. M. Stephen.

### Council.

(a) The attendance of members of the Council and of the standing committees was as set out in the accompanying table.

(b) The representatives of the Local Associations of Members, appointed on the invitation of the Council to attend the regular quarterly meetings of the Council, were as follows: Dr. T. E. Parker (Canterbury-Bankstown), Dr. A. M. Gledden (City), Dr. J. M. Alcorn (Central Southern), Dr. G. N. M. Aitkens (Central Western), Dr. A. S. Curtin (Eastern Suburbs), Dr. L. W. Wing (Far South Coast and Tablelands), Dr. W. F. Simmons (Illawarra Suburbs), Dr. L. Cowlishaw (Kuring-gai District), Dr. A. G. Brydon (Northern District), Dr. L. Fetherston (South Eastern), Dr. W. C. Darragh (South Sydney), Dr. E. A. Tivey (Warringah District), Dr. J. Brooke Moore, senior (Western), Dr. C. E. Vickery (Western Suburbs).

(c) The Council placed on record its appreciation of the valuable services rendered to the Association by Dr. J. A. Dick, who retired from the Council in March, 1936. Dr. Dick, who was elected a Vice-President of the Association at the last Annual Meeting, was President in 1910-1911, a Member of Council for thirty-four years, Honorary Librarian for thirty years, and representative on the Federal Council for fifteen years.

### Library.

Dr. G. C. Willcocks was appointed to the position of Honorary Librarian.

Donations of books and periodicals were received from the Australasian Medical Publishing Company, Limited, Dr. E. P. Blashki, Mrs. J. L. T. Isbister, Dr. W. Vickers, Dr. C. M. Edwards, Dr. J. C. Storey, Dr. J. Macdonald Gill, Dr. J. C. Hughes, Dr. E. J. Jenkins, Dr. G. H. S. Lightoller, Dr. H. C. R. Darling, Western Suburbs Medical Association, Section of Neurology and Psychiatry, Section of Radiology, Section of Surgery, Section of Pathology and Bacteriology, Section of Obstetrics and Gynaecology and the Section of Medicine.

The following additional publications have been purchased: "The Medical Annual", "Reports of the Medical Research Council", "Quarterly Bulletin of the Health Organisation", "The British Encyclopædia of Medical Practice".

## Affiliated Local Associations of Members.

Balmain District (affiliated 1913).  
 Border (affiliated 1908): *Honorary Secretary*, Dr. R. A. Robertson.  
 Canterbury-Bankstown (affiliated 1930): *Chairman*, Dr. G. J. Cousins; *Honorary Secretary*, Dr. G. Russell. Membership, 24. Four meetings were held.  
 Central Northern (affiliated 1910): *Honorary Secretary*, Dr. A. C. Arnold.  
 Central Southern (affiliated 1909): *Honorary Secretary*, Dr. R. G. Woods.  
 Central Western (affiliated 1910): *Chairman*, Dr. Colin Cole; *Vice-Chairman*, Dr. Arnold Bryant; *Honorary Secretary*, Dr. K. S. M. Brown. Membership, 50. Two meetings were held.  
 City (affiliated 1913): *Honorary Secretary*, Dr. L. R. Flynn.  
 Eastern Suburbs (affiliated 1911): *Chairman*, Dr. J. H. W. Leadley; *Vice-Chairman*, Dr. F. Smidlin; *Honorary Secretary*, Dr. B. W. Stevenson. Membership, 90. Five meetings were held.  
 Far South Coast and Tablelands (affiliated 1935): *Chairman*, Dr. J. S. McKee; *Honorary Secretary*, Dr. K. S. Jones. Membership, 12. One meeting was held.  
 Illawarra Suburbs (affiliated 1913): *Honorary Secretary*, Dr. P. L. Charlton.  
 Kuring-gai District (affiliated 1929): *President*, Dr. N. P. Boulton; *Vice-President*, Dr. B. G. Wade; *Honorary Secretary*, Dr. A. M. Aspinall. Membership, 65. Four meetings were held.  
 North Eastern (affiliated 1913): *Chairman*, Dr. F. N. Lynch; *Vice-Chairman*, Dr. A. J. Opie; *Honorary Secretary*, Dr. J. R. Ryan. Membership, 40. Three meetings were held.  
 Northern District (affiliated 1911): *Chairman*, Dr. H. G. D. Cookson; *Vice-Chairman*, Dr. J. K. Harblson; *Honorary Secretary*, Dr. R. J. Jackson. Membership, 66. Two meetings were held.

South Eastern (affiliated 1914): *Honorary Secretary*, Dr. L. Fetherston.

South Sydney (affiliated 1909): *Chairman*, Dr. W. C. Darragh; *Vice-Chairman*, Dr. E. P. Armstrong; *Honorary Secretary*, Dr. C. H. Jaede. Membership, 22. Two meetings were held.

Southern District (affiliated 1909): *Honorary Secretary*, Dr. C. R. Sim; *Acting Honorary Secretary*, Dr. L. R. Lennon.

Warringah District (affiliated 1929): *Honorary Secretary*, Dr. E. L. Newman. Membership, 51.

Western (affiliated 1908): *Chairman*, Dr. L. W. Tunley; *Vice-Chairman*, Dr. R. D. Mulvey; *Honorary Secretary*, Dr. S. R. Dawes. Membership, 75. Four meetings were held.

Western Suburbs (affiliated 1908): *Chairman*, Dr. M. L. Coutts; *Vice-Presidents*, Dr. F. C. Rogers and Dr. R. V. Graham; *Honorary Secretary*, Dr. R. F. Back. Membership, 104. Five meetings were held.

## Annual Meeting of Delegates.

The twenty-fourth annual meeting of delegates of the affiliated Local Associations of Members with the Council was held on Friday, October 2, 1936. An account of the proceedings of the meeting appeared in *THE MEDICAL JOURNAL OF AUSTRALIA* of October 31, 1936, pages 608-612.

The delegates present at the meeting were as follows: *Canterbury-Bankstown*, Dr. Kevin Byrne; *Central Northern*, Dr. A. T. Roberts; *Central Southern*, Dr. R. O. Williams; *Central Western*, Dr. G. N. M. Aitkens; *City*, Dr. A. M. Gledden; *Eastern Suburbs*, Dr. A. S. Curtin; *Illawarra Suburbs*, Dr. W. F. Simmons; *Kuring-gai District*, Dr. B. G. Wade; *Northern District*, Dr. A. G. Brydon; *South Eastern*, Dr. H. H. Lee; *Warringah District*, Dr. E. A. Tivey; *Western*, Dr. J. T. Paton; *Western Suburbs*, Dr. C. E. Vickery.

## ATTENDANCES AT COUNCIL AND STANDING COMMITTEE MEETINGS.

	Council.	Committees.				
		Executive and Finance.	Organization and Science.	Medical Politics.	Hospitals.	Ethics.
DR. G. M. BARRON .. .. .	7	—	—	—	—	8
DR. GEORGE BELL (Honorary Treasurer and Premises Attorney) .. .	8	12	5	8	2	4
SIR CHARLES BLACKBURN .. .	5	—	—	—	—	7
DR. K. S. MACARTHUR BROWN .. .	8	—	—	11	—	—
DR. A. J. COLLINS .. .	8	—	—	11	3	—
DR. A. M. DAVIDSON (Past President) .. .	7	9	—	—	—	—
DR. L. A. DEY (President Elect) .. .	6	12	6	11	3	9
DR. B. T. EDYE* .. .	2	—	—	—	—	1
DR. A. J. GIBSON .. .	7	9	—	—	—	—
DR. R. V. GRAHAM .. .	5	7	—	5	—	—
DR. HUGH HUNTER .. .	8	—	—	11	—	—
PROFESSOR W. K. INGLIS† .. .	4	—	3	—	—	—
DR. C. H. E. LAWES (Honorary Secretary) .. .	5	8	1	4	—	2
DR. R. J. MILLARD .. .	6	—	—	—	—	5
DR. A. A. PALMER .. .	6	—	—	—	—	9
DR. E. H. M. STEPHEN (President) .. .	8	11	6	10	2	9
DR. J. C. STOREY .. .	7	—	—	11	—	—
DR. WILFRED VICKERS .. .	7	11	—	—	4	—
DR. A. S. WALKER .. .	8	—	6	—	4	—
DR. G. C. WILLCOCKS (Honorary Librarian) .. .	8	12	6	—	—	—
Meetings held .. .	8	12	7	11	4	9

\* Leave of absence, March-December, 1936.

† Leave of absence, February-October, 1936.

### Sections for the Study of Special Branches of Medical Knowledge.

Anæsthesia (inaugurated 1934): *Chairman*, Dr. W. I. T. Hotten; *Honorary Secretary*, Dr. H. J. Daly. One meeting was held in conjunction with a meeting of the Branch.

Genito-Urinary and Venereal Diseases (inaugurated 1928).

Hygiene and Preventive Medicine (inaugurated 1922): *Honorary Secretary*, Dr. A. H. Baldwin.

Medical Literature and History (inaugurated 1925): *Honorary Secretaries*, Dr. L. Cowlishaw and Dr. H. M. Moran.

Medicine (inaugurated 1924): *Honorary Secretary*, Dr. K. B. Noad.

Neurology and Psychiatry (inaugurated 1924): *Chairman*, Dr. J. A. L. Wallace; *Vice-Chairman*, Dr. G. P. U. Prior; *Honorary Secretary*, Dr. D. W. H. Arnott. Five meetings were held, including one in conjunction with a meeting of the Branch.

Obstetrics and Gynecology (inaugurated 1925): *Chairman*, Dr. A. J. Gibson; *Vice-Chairman*, Dame Constance D'Arcy; *Honorary Secretary*, Dr. H. A. Ridler. Four meetings were held, including one in conjunction with a meeting of the Branch.

Orthopædics (inaugurated 1923): *Chairman*, Dr. F. McC. Callow; *Vice-Chairman*, Dr. T. Y. Nelson; *Honorary Secretary*, Dr. A. R. Hamilton. Five meetings were held, including two in conjunction with meetings of the Branch.

Oto-Rhino-Laryngology (inaugurated 1924): *Honorary Secretary*, Dr. E. P. Blashki. Four meetings were held, including one in conjunction with a meeting of the Branch.

Pædiatrics (inaugurated 1921): *Honorary Secretary*, Dr. L. H. Hughes. One meeting was held in conjunction with a meeting of the Branch.

Pathology and Bacteriology (inaugurated 1924): *Chairman*, Dr. Oliver Latham; *Honorary Secretary*, Dr. E. F. Thomson. Five meetings were held, including two in conjunction with meetings of the Branch.

Radiology (inaugurated 1926): *Honorary Secretary*, Dr. A. T. Nisbet. Five meetings were held, including one in conjunction with a meeting of the Branch.

Study of Cancer (inaugurated 1928).

Surgery (inaugurated 1925): *Chairman*, Dr. J. Colvin Storey; *Honorary Secretary*, Dr. C. E. Winston. Three meetings were held, including two in conjunction with meetings of the Branch.

### British Medical Association Lectures.

Lectures were arranged as follows:

Central Southern Medical Association, Goulburn, March 27, 1936: Dr. A. J. Collins, "Cardio-Vascular Degeneration and Treatment of Heart Failure".

Northern District Medical Association, Tamworth, September 16, 1936: Dr. W. Ramsay Beavis, "Common Diseases of the Ear, Nose and Throat as met with in General Practice".

North-Eastern Medical Association, Lismore, April 4, 1936: Dr. H. B. Williams, "Difficult Obstetrics".

Western Medical Association, Molong, September 24, 1936: Dr. W. I. T. Hotten, "Some Recent Advances in Anæsthesia".

### Secretariat.

To enable the Federal Council to implement its constitution, approval was given to an arrangement whereby the Assistant General Secretary of the Federal Council will act, part time, as an assistant to the Medical Secretary.

This arrangement will allow the Medical Secretary, who is also General Secretary of the Federal Council, to devote more time to organization work on behalf of the Federal Council.

### Federal Council.

The Federal Council of the British Medical Association in Australia met in Sydney on August 20, 1936, and in Melbourne on January 27, 1937.

Dr. J. A. Dick and Dr. G. Bell represented the Branch at the meeting on August 20 and Dr. G. Bell and Dr. A. J. Collins at the meeting on January 27.

Reports of the proceedings of the meetings appeared in THE MEDICAL JOURNAL OF AUSTRALIA, September 19, 1936, and February 20, 1937.

### Australasian Medical Congress (British Medical Association).

The Fifth Session of the Australasian Medical Congress (British Medical Association) will be held in Adelaide from August 23 to 28, 1937. Dr. A. A. Palmer has been appointed a Vice-President of Congress and Dr. A. S. Walker, Honorary Local General Secretary.

The following members have been appointed Presidents and Vice-Presidents of Sections of Congress:

*Presidents*: Dr. G. R. Halloran (Oto-Rhino-Laryngology), Professor Keith Inglis (Pathology, Bacteriology and Experimental Medicine), Dr. J. G. Edwards (Radiology and Electrical Therapy), Dr. R. B. Wade (Orthopædic Surgery), Dr. L. Cowlishaw (Medical Literature and History).

*Vice-Presidents*: Dr. H. Hunter (Anæsthesia), Dr. C. K. Cohen (Ophthalmology), Dr. A. S. Walker (Medicine), Dr. F. B. Craig (Obstetrics and Gynecology), Dr. J. J. Witton Flynn (Dermatology), Dr. E. H. M. Stephen (Pædiatrics), Professor Harvey Sutton (Public Health, Preventive Medicine and Tropical Hygiene), Dr. G. Bell (Surgery), Dr. H. M. North (Neurology and Psychiatry), Dr. J. C. Storey (Naval, Military and Air Force Medicine and Surgery).

### Premises Revenue Account.

The Premises Revenue Account discloses a net surplus of £1,608 3s. 2d. as against a net deficit of £294 15s. 5d. for the year ended December 31, 1935, being an improvement of £1,902 18s. 7d. This improvement of £1,902 18s. 7d. in the net amount of revenue earned is mainly due to an increase of £795 12s. in the rent revenue earned, together with the fact that the whole of the cost of painting the exterior of the building (£1,219 5s.) was charged in the 1935 accounts.

A comparison of the annual percentages of expenditure to revenue from the time of opening the building in 1930 up to December 31, 1936, is as follows.

	Percentage of Expenses to Revenue.	Percentage of Result to Revenue.
½ year to December 31, 1930	119.4	Deficiency 19.4
1 year to December 31, 1931	114.8	Deficiency 14.8
1 year to December 31, 1932	109.8	Deficiency 9.8
1 year to December 31, 1933	97.9	Surplus 2.1
1 year to December 31, 1934	77.7	Surplus 22.3
1 year to December 31, 1935 (including depreciation)	102.1	Deficiency 2.1
1 year to December 31, 1936 (including depreciation)	89.0	Surplus 11.0

The percentages of rent revenue, expenses and depreciation and the percentage of net surplus for the year to the capital value of the British Medical Association House, as shown by the books at December 31, 1936, namely, £180,335, is as follows:

Rent Revenue (including amount charged for British Medical Association Branch offices et cetera) . . . . .	8.16%
Sundry Expenses, Interest and Provision for Painting Building . . . . .	5.72%
Depreciation of Building . . . . .	1.55%
	<hr/> 7.27%
Net Surplus for Year . . . . .	<hr/> 0.89%

**Public Hospitals Act, 1929-35.**

Representations have been made to the Hospitals Commission that the Regulations (Regulation 30), *Public Hospitals Act, 1929-34*, be amended so that, in the event of the responsible officer of a hospital failing to notify a patient that the fees chargeable by the medical attendant shall be a matter of arrangement between him, the patient, and the medical attendant, the latter shall not be deprived of the right to recover his charges.

**Contract Practice.****Friendly Society Lodges.**

The Common Form of Agreement for use between Medical Officer and Friendly Society Lodge has been amended as follows:

1. Clause 5. (a) By the addition after the word "Act" in line 10 of the following words: "... or any member who has been determined by the Commissioner administering the *Commonwealth Employees' Compensation Act*, No. 24, 1930, to be entitled for the time being to the medical benefits of the said *Commonwealth Employees' Compensation Act* ..."

(b) By the addition after the word "Agreement" in line 15 of the following words: "And provided further that the foregoing provisions relating to an individual member entitled for the time being to the medical benefits of the *Workers' Compensation Act, 1926-29*, or *Commonwealth Employees' Compensation Act, 1930*, shall not be construed so as to deprive any of the persons included in the definition of 'member' by Clause 26 of this Agreement other than the 'individual member' referred to in such foregoing provisions from continuing to be entitled to the benefit of the services of the medical officer under this agreement."

2. Clause 18. (a) By the addition at the end of the clause of the following words: "... prior to the operation. For the purposes of this clause a minor surgical operation in which local anaesthesia is produced by means of what is known as local freezing shall be deemed an operation not requiring a local anaesthetic."

3. By the addition of a new clause 16 (a): "Whenever the medical officer shall be away from his residence or unable to render the services hereby agreed to be rendered for a period exceeding 24 hours, he shall arrange for the medical services required under this agreement to be provided by another practitioner during such absence or inability, and the rendering of such service by such medical practitioner shall be deemed a due performance by the medical officer of his obligations hereunder."

The amendments will come into force on April 1, 1937.

**Workers' Compensation Act, 1926-29.**

During the year the attention of Council was directed to a circular, copies of which had apparently been sent to some Members of Parliament, in which were compared the amounts paid for medical treatment and compensation for the periods 1926-27 and 1934-35.

As the comparison seemed to show that the proportion of the cost of medical treatment to the compensation had increased greatly since the passing of the 1926 Act and as no reasons for the increase were given, a letter was addressed to each Member of Parliament stating the reasons for the increase (the chief being the passing of the *Public Hospitals Act* in 1929, which enabled the board of a public hospital and also the attending medical practitioner to recover payment for services rendered to an injured worker in the hospital) and pointing out that if a dissection were made of the figures contained in the circular it would be found that the fees charged by medical practitioners were in reasonable proportion.

**Immunization against Diphtheria.**

The Council is pleased to report that following the representations made to the Minister for Health in support of the Director-General of Health's proposal for the immunization against diphtheria of children, a state-wide plan in which the Department of Health, Municipal and Shire Councils, and members of the profession cooperated, was instituted during the year.

**National Health Insurance.**

In view of the prominence given by Governments during the past two (2) years to the question of national health insurance, it was deemed advisable to send the Medical Secretary to England to study this important subject.

The fund of information which Dr. Hunter has acquired should, in the event of health insurance becoming a subject of practical politics, be of great value to the profession, not only in New South Wales, but throughout Australia.

The Council is greatly indebted to those members who carried out the duties of the Medical Secretary during his absence abroad.

Opportunity was taken during a stay in Sydney to interview Sir Walter Kinnear, Comptroller of Insurance, Ministry of Health of Great Britain, who, at the request of the Commonwealth Government, was visiting Australia.

**Treatment of Wounds and Disabilities Arising from the Use of Poison Gas.**

The Department of Defence, to whom representations were made regarding the training of medical practitioners and medical students in the treatment of wounds and disabilities arising from the use of poison gas, has informed the Council that there will shortly be available copies of Air Raid Precaution Handbook No. 3, entitled "Medical Treatment of Gas Casualties", and that copies of Air Raid Precautions Handbook No. 2, "First Aid for Gas Casualties", will probably be issued in addition.

**Ambulance Transport of Fractured Thighs.**

Further representations have been made to the Minister for Health urging the adoption of the modified Thomas splint as standard equipment for the transport of persons who have sustained fractures of the thigh and/or leg.

**British Medical Agency of New South Wales Limited.**

The annual report of the British Medical Agency of New South Wales Limited was published in *THE MEDICAL JOURNAL OF AUSTRALIA*, November 14, 1936, page 695.

**Congratulations.**

Congratulations were extended to Sir Charles Blackburn, Dr. G. Moncrieff Barron, O.B.E., Dr. W. A. Ramsay Sharp, O.B.E., and Dr. A. N. Yuille, O.B.E., on the honour conferred on them by His Majesty King George VI.

**Social.**

*Golf*.—The annual competition—18 holes stroke handicap for the Rutherford Darling Cup—which was played on the links of the Concord Club, December 3, and New South Wales Club, December 4, and final on links of Bonnie Doon Club, December 23, was won by Dr. H. M. Owen, the runner-up being Dr. W. B. Fry.

**Report to Members.**

The Council has pleasure in presenting to members the Balance Sheet and Accounts in respect of the financial year which terminated on December 31, 1936.

The net surplus of revenue over expenditure for the year amounted to £1,446 4s. after making provision for all known expenses.



**BRANCH ACCOUNT.**

**Income and Expenditure Account for the Year Ended December 31, 1936.**

	£	s.	d.	£	s.	d.		£	s.	d.	£	s.	d.
To Salaries .. .. .	2,234	3	0				By Subscriptions received—						
„ Rent—Offices, etc. .. .	1,000	0	0				Year 1936 .. .. .	7,789	5	11			
„ Printing and Stationery .. .	201	19	4				Year 1935 .. .. .	255	13	6			
„ Stamps and Telegrams .. .	155	17	0				Previous years .. .. .	37	3	0			
„ Telephones .. .. .	78	17	5								8,082	2	5
„ Legal Expenses .. .. .	17	4	10				Less Proportion due to—						
„ Travelling Expenses .. .	536	1	6				British Medical Association	2,084	7	5			
„ Insurance .. .. .	3	17	4				THE MEDICAL JOURNAL OF						
„ Exchange and Bank Charges .. .	7	11	11				AUSTRALIA .. .. .	1,638	5	0			
„ Refreshments—Meetings .. .	15	13	6								3,722	12	5
„ Newspapers .. .. .	3	19	3										
„ Sundry Petty Expenses .. .	23	0	6								4,359	10	0
„ Gratuities .. .. .	20	0	0				„ Interest .. .. .	4	0	0			
„ Federal Council .. .. .	163	2	0				„ Donations .. .. .	5	5	0			
„ Tea Money .. .. .	26	12	6				„ Rent, Assembly Hall .. .	85	3	6			
„ University Club—Luncheon .. .	4	17	6				„ Sales—C.F.A., etc. .. .	27	5	0			
„ Renovating Office Furniture .. .	28	12	6								121	13	6
				4,521	10	1	„ Balance — Deficit for year						
„ Depreciation—							ended December 31, 1936,						
Library .. .. .	97	1	7				transferred to Accumulated						
Office Furniture and Equip-							Funds Account .. .. .				161	19	2
ment .. .. .	24	11	0										
				121	12	7							
				£4,643	2	8					£4,643	2	8

### INDUCTION OF PRESIDENT.

Dr. E. H. M. Stephen inducted the President for the year 1937-1938 (Dr. Lindsay A. Dey). Dr. Dey thanked the members for his election.

THE annual meeting of the Tasmanian Branch of the British Medical Association was held at the Tasmanian Museum on February 27, 1937. DR. E. BETTINGHAM MOORE, the President, in the chair.

### Financial Statement.

Dr. Thomas Giblin, the Honorary Treasurer, presented the financial statement and balance sheet for the year ended December 31, 1936. The statement is published herewith.

**Annual Report of Council.**

The Secretary, Dr. J. H. B. Walch, presented the annual report, which was adopted. The report is as follows:

The membership of the Branch, which was 86 at the beginning of 1936, was 91 at the beginning of 1937. Four new members have been elected, six have transferred into the Branch, and six have resumed membership by payment of the overdue subscription within the period of grace; while one has left the State, one has died, and nine have lapsed through non-payment of their subscription for 1936.

Since the last annual meeting there have been held ten ordinary meetings of the Branch, the average attendance being 16.5, compared with 15.25 in the previous year.

Papers have been read by Dr. Whishaw, Dr. Fay, Dr. Counsell, Dr. Goddard, Dr. J. B. Hamilton, and Dr. F. A. Maguire; while clinical notes have been contributed by Dr. Shugg, Dr. Duncombe and Dr. T. Butler; and Dr. McKillop's film illustrating the X ray treatment of cancer was shown.

Fifteen meetings of the Branch Council have been held, the attendance being as follows:

Dr. Brettingham Moore	14	Dr. Goddard	10
Dr. Stoddart Barr	7	Dr. Short	14
Dr. Gibson	12	Dr. T. Giblin	11
Dr. Crowther	11	Dr. J. Walch	15
Dr. W. Giblin	6		

The Northern members of the Council, Dr. Pryde and Dr. Grove, have not attended.

Among the numerous matters that have come under the consideration of the Branch Council during the year, there are only a few that need be mentioned in this report. A question as to the position of lodge doctors, who have no signed agreements with their lodges, was raised, especially with their right to claim payment under the *Workers' Compensation Act*. Legal opinion was obtained, and our solicitors expressed the opinion that the terms of the Model Lodge Agreement would be held to apply in such cases, including the clause exempting injured workers receiving treatment under the act from lodge medical benefits, so that a fee could be recovered from the insurance companies.

Another matter requiring legal advice was the question of professional secrecy in connexion with patients concerned in police inquiries. Our solicitors, in consultation with the President and Secretary, drew up a statement presenting the views of the Branch Council. The statement was published in the Press and submitted to the Solicitor-General and to the Law Society.

National health insurance has received the consideration of the Branch Council on several occasions through the year, chiefly for the purpose of instructing our representatives on the Federal Council as to the views of the Branch. Among other Federal matters concerning which we have been asked to express our views are uniform medical registration throughout the Commonwealth, the expenditure of the £1,000 grant from the Association in England to the Federal Council, and the formation of a Federal secretariat.

The Branch Council has approached the Council of the Victorian Branch with a view to arranging a scheme by which our members could make use of books and periodicals from the library of the Victorian Branch. The matter is not yet finalized, but it is hoped that, in the near future, those members who desire to avail themselves of the privilege will be able to have books posted to them from the library. The proposal has been awaiting consideration by the Northern Division, whose reply to our letter has just been received.

## Election of Office-Bearers.

The following members were elected office-bearers for the ensuing twelve months:

*President:* Dr. A. Pryde.

*President-Elect:* Dr. R. Whishaw.

*Vice-President:* Dr. F. W. Fay.

*Members of Council:* Dr. E. Brettingham Moore, Dr. T. C. Butler, Dr. F. Short.

*Representatives to the Federal Council:* Dr. W. E. L. Crowther, Dr. Stuart Gibson.

*Honorary Treasurer:* Dr. Thomas Giblin.

*Secretary:* Dr. J. H. B. Walch.

*Secretary, Northern Division:* Dr. J. L. Grove.

## Induction of President.

Dr. E. Brettingham Moore inducted Dr. A. Pryde to the office of President for the ensuing twelve months.

## President's Address.

Dr. E. Brettingham Moore, the retiring President, in the opening part of his address, said that he had to thank the members of the Branch very sincerely for the honour they had done him in appointing him for a second term as President of the Branch. This was no empty phrase, for he considered that the office of president in any Branch of the British Medical Association, no matter how small, carried with it many responsibilities and reflected in some degree the dignity of the parent Association. Not the least of these responsibilities was the delivery by the retiring president of an address to members of the Branch.

Dr. Moore had been so long interested in midwifery that he had decided to proffer some notes, which he termed "Obstetrical Jottings", as they were merely reflections and suggestions, the result of an actual experience running to between 4,000 and 5,000 cases. He did not claim any originality for them, and no doubt in some he would evoke sharp criticism, but he offered them as the result of considerable thought and some experiment.

Dealing first with persistent occipito-posterior presentation, Dr. Moore said that the vast majority of vertex cases presented with the sagittal suture in the right oblique, on account of the greater accommodation afforded in this diameter, the opposite oblique diameter being encroached upon by the rectum. Moreover, the continual pressure of the long diameter of the head during a labour in which normal rotation did not take place, accentuated the length of this oval. In other words then, the soft parts of the pelvis moulded as well as the fetal head. Any attempt, therefore, to rotate the head which fell short of half a circle was doomed to failure, the long diameter of the skull naturally slipping back into the long oblique diameter of the pelvis, with the occiput still posterior.

If pains were taken to rotate the vertex at least half a circle, or more if possible, malrotation could not possibly recur. The only instrument necessary for this was the hand, and Dr. Moore strongly deprecated the use of various types of forceps, owing to the unnecessary dangers involved. A point to remember was that the normal rotation of the hand at the wrist was less than half a circle, and the needed additional twist had to be obtained from the shoulder or even the body. In few cases would rotation be found difficult, and in none impossible.

Dr. Moore had devoted considerable space to persistent occipito-posterior presentation, as it was so common and not really a bugbear if handled properly.

In Dr. Moore's opinion, the next most common difficulty was the decision in a case which did not "engage". Were they or were they not to induce labour before term?

Dr. Moore was coming more and more to the conclusion that most of these cases were best left alone. For one thing, the fetal mortality of even a medical induction was quite considerable. This might be placed conservatively at 5% at least; moreover, the difficulty in rearing a premature infant increased this figure.

Quite apart from these fetal considerations, if a surgical induction had to follow on the medical, which was so often ineffective, the additional risk of infection should be borne in mind. In any case, in Australia at all events,

an enormous percentage of these doubtful cases would resolve themselves. If after a trial labour no progress was made, a low cervical Cesarean section was a safer and by no means more difficult operation than high and very often "failed forceps".

The medical induction referred to above was the London method; this consisted in the use of castor oil, hot bath, quinine, enema and tight binder, followed by injection of pituitrin; in view of this formidable array, it was no wonder that a number of babies died *in utero*. Dr. Moore had recently decided to halve the dose of quinine and omit the pituitrin altogether.

The surgical method that he favoured was one by which the amniotic sac was tapped, about a pint to a pint and a half of fluid being withdrawn, but the bag of forewaters being preserved intact to perform its natural function as dilator of the cervix.

The instrument used was a male silver catheter of large bore, bent to a mild "S" shape, rather after the style of a uterine dressing forceps. The rounded end was squared to a blunt point to penetrate the membranes without too much pressure.

Under anaesthesia the left index finger was swept round the lower uterine segment separating the membranes as far up as possible.

Guided by this finger, the catheter was introduced high up and the membranes were pierced. After the required quantity of liquor had drained through the catheter, it was withdrawn and very little more escaped. During the labour the presenting part occluded the small hole in the membranes, leaving an intact bag of forewaters.

This method also obviated leaving a foreign body for an indefinite period in the maternal passages, with its concomitant risk of sepsis.

The lessened incidence of eclampsia was really the only striking result of the increased attention given to antenatal care in the clinics of the hospitals generally. Nevertheless it was by no means eradicated and Dr. Moore wished to make a suggestion or two as to its prophylactic treatment. He thought that it was generally agreed that a deficiency of calcium was one of the factors in its causation and he made a routine of prescribing the lactate in the form of a powder or as an increased ration of milk during the latter months of pregnancy. The necessity of stressing the importance of sunshine or its equivalent of vitamin D was not to be overlooked, and the latter was catered for by innumerable proprietary firms.

In the pre-eclamptic stage an attempt should be made to mobilize the calcium already in the tissues by giving parathyroid extract. The diminution in the albumin content of the urine was usually striking for a while, but there appeared to be a refractory period after a week or ten days beyond which it was useless to persevere with the parathyroid.

In treating the condition itself, in addition to the usual recognized methods aiming at elimination of toxins by gastric lavage *et cetera* and of controlling the fits with morphine, Dr. Moore suggested a trial of magnesium sulphate injected intramuscularly; two cubic centimetres of a 50% solution of chemically pure magnesium sulphate should be injected deeply into the gluteal muscles and might be repeated two or three times if occasion warranted it. Its application in this regard had been suggested to Dr. Moore by observing its action in Gwathmey's oil-ether system of inducing analgesia in childbirth. Gwathmey gave magnesium sulphate for its action in reinforcing and prolonging the action of morphine. It acted by depressing the lower spinal centres and dulled the reflexes arising from uterine contractions.

Dr. Moore always noticed a diuresis in these cases. This he ascribed to the magnesium sulphate, and he considered this combined with its anti-spasmodic effect an ideal combination for an eclamptic. Dr. Moore's results had been excellent, and he would be glad to hear of the results in the hands of his colleagues.

Discussing *asphyxia neonatorum*, Dr. Moore said he thought he was correct in ascribing a considerable portion of the mortality from this asphyxia to too energetic treatment. It was hardly necessary to remind those present that the blue babies would right themselves when their

THE BRITISH MEDICAL ASSOCIATION (TASMANIAN BRANCH).  
Statement of Receipts and Payments for Year ended December 31, 1936.

RECEIPTS.		PAYMENTS.	
	£ s. d.		£ s. d.
To Balance as at January 1, 1936 .. .. .	138 6 4	By Australasian Medical Publishing Company, Limited .. .. .	52 0 0
" Members' Fees .. .. .	374 13 3	" Remittance to London (Capitation Fees) ..	111 11 3
" Interest on Fixed Deposit, E.S. & A. Bank ..	6 4 5	" Federal Council (Branch Contribution) ..	8 4 0
" Interest on Fixed Deposit, Hobart Savings Bank .. .. .	9 7 11	" Northern Division Grant .. .. .	44 10 0
" Interest on Debentures, Australasian Medical Publishing Company, Limited .. .. .	4 4 7	" Secretary's Honorarium .. .. .	30 0 0
" Interest, Commonwealth Inscribed Stock ..	10 2 6	" Rent, Royal Society .. .. .	10 0 0
		" Legal Fees, Murdoch, Cuthbert and Clarke ..	2 2 0
		" Audit Fees—Adams and Bennetto (two years) .. .. .	4 4 0
		" Typing, Printing and Stationery .. .. .	4 3 1
		" Secretary's Petty Cash .. .. .	16 1 11
		" Lantern Slide and Developing .. .. .	2 5 0
		" Bank Charges <i>et cetera</i> .. .. .	0 18 9
		" Balance .. .. .	256 19 0
	<b>£542 19 0</b>		<b>£542 19 0</b>

## STATEMENT OF ASSETS.

	£ s. d.
Furniture at Library .. .. .	20 0 0
Cash at E.S. & A. Bank .. .. .	256 19 0
Fixed Deposit at E.S. & A. Bank .. .. .	100 0 0
Commonwealth Inscribed Stock .. .. .	300 0 0
Fixed Deposit with Hobart Savings Bank ..	150 0 0
Australasian Medical Publishing Company, Limited—Debentures .. .. .	95 0 0
	<b>£921 19 0</b>

Audited and found correct.

(Signed) ADAMS & BENNETTO,  
Chartered Accountants (Aust.),  
Auditors.

airways were clear if left alone, whereas the "white" babies were profoundly shocked, and if they were vigorously punched and pummelled, their last chance was gone. Dr. Moore's two sheet anchors in these emergencies were "Coramine" (or "Cardiazol") and "Carbogen". Two to three minims of the first into the muscles and a few breaths of "Carbogen", if need be by artificial respiration, effected wonders.

He had had a rubber bag made with a tube at each end from a basket-ball bladder. One end was fitted onto the metal "Carbogen" container—part of a Rubin outfit—the other led to a mask.

The "Carbogen" was thus delivered in a highly concentrated condition, and the supply was regulated and observed by the distension of the bag.

Once the respiration was started, a warm bath was the quickest way of restoring the warmth so essential to the child's existence. Above all, the nurse should not be allowed to bath an infant which had been showing signs of shock at birth until after twenty-four hours or more had elapsed.

Turning to the question of anaesthesia, Dr. Moore said that after one or two unpleasant experiences with chloroform in his early days, when he had had to drop his instruments and hastily resort to artificial respiration and other measures, he came to the conclusion that a safer anaesthetic was necessary. At the same time, ease of administration was also an essential, for in most cases the anaesthesia had to be continued by the sister or nurse. For nearly twenty years he had used a mixture consisting of three parts ether to one of chloroform. It was administered on an open mask, and he had never had a moment's anxiety with it.

An impacted shoulder was a fairly common cause of delay in the completion of the second stage. In most text-books but little space was devoted to the manoeuvres necessary to free the impacted shoulder, which was, of course, the anterior one. Dr. Moore found the easiest way to accomplish this was to rotate the body of the infant. The forefinger was hooked into the back of the posterior axilla and the shoulder was pushed across the chest of the child. This had the double effect of narrowing the biacromial diameter and of releasing the anterior shoulder from the *symphysis pubis*. A combined traction on the head and the axilla would then easily effect delivery.

In conclusion, Dr. Moore referred to a condition which, although strictly not obstetrical, nevertheless fell to the lot of the obstetrician. He referred to pseudocyesis. This was by no means rare and he had had two cases within the last few weeks. It seemed incredible that apparently intelligent women could bolster up this fictitious condition with such determination, whether consciously or unconsciously he could not determine. Nevertheless the fact remained that in all cases that he had seen, the patients contributed to the physical signs of pregnancy by stiffening their abdominal muscles and protruding their chests. If their attention could be otherwise engaged, even momentarily, it was often possible to recognize that there was no large abdominal tumour. In many if not in most cases the patient would go on to term and have some pains and often a show—probably menstrual. How the suppression of the menses was brought about, or whether they were concealed, he frankly did not know. In any case the chief difficulty was what course to pursue. Dr. Moore felt that nothing was to be gained by insisting that the patient had never been pregnant; the interests of the patients were best observed by falling in with their views to some extent.

Their sister profession had a Latin tag to the effect that "*De minimis non curat lex*"; but with medicine Dr. Moore thought that the smallest things often had profound and far-reaching effects, so he had mentioned some points that might appear trivial at first sight.

## SCIENTIFIC.

A MEETING of the New South Wales Branch of the British Medical Association was held at the Sydney Hospital on October 22, 1936. The meeting took the form of a series of clinical demonstrations by members of the honorary staff.

## Acute Generalized Lymphadenitis.

DR. GEORGE WILLCOCKS showed a boy, aged ten years, who had been admitted to the surgical wards of the

hospital in January, 1936. The history was that the boy had been ill for some days prior to admission and that he complained of feeling hot. At the time of his admission his temperature was 39.4° C. (103° F.) and on the three following days his temperature rose to 38.6° C. (101.6° F.); the pulse rate was correspondingly raised. Enlarged lymphatic glands were detected in the neck, axillæ and groin; the glands were firm and varied in size, but no gland was bigger than an almond. The spleen and liver were not palpable. The leucocytes numbered 15,620 per cubic millimetre; of the leucocytes, 63% were neutrophile cells, 28% were lymphocytes and 4% were eosinophile cells. The glands remained enlarged for three weeks and were still enlarged when the child left hospital.

It was pointed out that the diagnosis was made by exclusion—it was thought that the condition was acute generalized lymphadenitis. Agglutination tests did not reveal the presence of heterophile antibodies. Clinically the condition was indistinguishable from glandular fever.

A second patient, a boy, aged nine years, who had been living four doors away from the previous patient, was admitted to hospital in July, 1936 also suffering from generalized adenitis. For five days the boy had suffered from headache, sore gums, a lump in the neck and lumps in the groins and axillæ. For three or four days he had been feverish. His previous illnesses included measles, pertussis, bronchitis and colds.

At the time of the boy's admission to hospital, examination revealed generalized enlargement of the glands in the posterior triangles of the neck and of the epitrochlear, axillary and inguinal glands. The liver margin extended half an inch below the costal margin; the spleen was thought to be palpable. The gums were red, ulcerated and painful. *Streptococcus viridans* was found on a throat swabbing. The agglutination test with sheep's corpuscles yielded no reaction. The patient's temperature was 37.8° C. (100° F.), but it subsequently became normal. On July 22, 1936, the lymphocytes numbered 12,200 per cubic millimetre; of these, 44% were lymphocytes, 4% were monocytes and 50% were neutrophile cells. At the time of the meeting the glands were still enlarged.

DR. EDGAR STEPHEN said that there had recently been an epidemic of acute generalized lymphadenitis, indistinguishable clinically from glandular fever.

#### Hypertension and Acromegaly.

Dr. Willcocks also showed a man, aged fifty-two years, who complained of matutinal headache, frontal, vertical and occipital, of three years' duration; failing vision of two years' duration, the vision in the left eye being worse than that of the right; weakness and lassitude that had prevented the patient from doing any work for the past eighteen months; breathlessness on exertion of eighteen months' duration; puffiness under the eyes of two to three years' duration. The patient gave a history of having had double pneumonia, colitis and chronic bronchitis in 1916.

Examination of the patient at the time of his admission to hospital revealed pallor, coarse features, a large nose, coarse skin, and big hands and feet. His systolic blood pressure was 230 and his diastolic pressure 130 millimetres of mercury. The heart was hypertrophied, the left border being five and a quarter inches from the mid-line; a systolic murmur was present. The chest was emphysematous; a few râles were audible at the base of the left lung. Examination of the ocular fundi revealed papilloedema; there was no change in the fields. The urine was acid in reaction, its specific gravity was 1015, albumin was present, but no other abnormal constituent was found. The blood urea was 15 milligrammes per centum, and the blood creatinine was 2 milligrammes per centum. The pupils were equal and reacted to light. The knee jerks were present and equal. X ray examination revealed an enlarged *sella turcica*.

DR. R. A. MONEY thought that possibly a cerebral neoplasm was present, and suggested diagnostic encephalography.

DR. JOHN HALLIDAY observed that osteoporosis of the long bones was present. The man's appearance was typical of acromegaly, and possibly a tumour was present.

#### Pulmonary Neoplasm.

Dr. Willcocks's fourth patient showed clinical and radiological signs of pulmonary neoplasm. The history was one of pain in the left breast of six months' duration. There had been no other symptoms. Examination revealed dullness on percussion at the apex of the left lung, increased vocal fremitus at that area, and faint breath sounds. X ray examination revealed an opacity extending out into the left lung from the lower part of the left hilar region. Clubbing of the fingers of both hands was very pronounced. The Wassermann test gave no reaction. Dr. Willcocks explained that bronchoscopy would be carried out, and possibly a partial pneumothorax would be induced for purposes of localization. Lipiodol would also be injected in order to delimit the growth.

#### Treatment of Peptic Ulcer by Histidine.

Dr. Willcocks also gave some particulars regarding a series of patients, suffering from peptic ulceration, who had been treated by injections of histidine. The patients had been treated and the statistics had been prepared by Dr. Henry, of the resident medical staff. Of the sixteen patients treated, three, as far as could be shown clinically and radiologically, had been completely relieved; ten had obtained symptomatic relief, but X ray examination did not show that the ulcer had been healed.

#### Rheumatoid Arthritis.

DR. H. C. ADAMS showed a patient who was suffering from rheumatoid arthritis. The patient, a man, twenty-seven years of age, gave a history of: (a) swelling and pain in the joints since December, 1935; (b) sweating and loss of weight (four stone in twelve months); (c) recurrent sore throats; (d) breathlessness and palpitation on slight effort, present for nine months; (e) discomfort after meals—acid eructations and flatulence—of nine months' duration. The patient had had his tonsils removed in 1935; he denied having suffered from venereal disease. There was no history of alcohol; the patient did not smoke.

Examination revealed swelling, redness and tenderness with heat, and painful and limited movement in almost every part of the body. The muscles had wasted and contractural deformities were present. The spine was tender and scoliosis was present. The gums were retracted and several teeth were carious. Muco-pus was seen in the pharynx. No abnormality was detected in the abdomen. The pulse was rapid. On X ray examination evidence of "well-marked polyarthritis, probably rheumatoid," had been found. Sepsis was found at the apex of the upper right central and lateral incisor teeth. A septic root remained in the bicuspid area on both sides. The left third molar tooth was unerupted. Neither the Wassermann nor the Kahn test yielded a reaction. No organisms were grown on culture of the urine, though the urine contained occasional red cells and pus cells. A fractional test meal was given; the total acid did not rise above 15 and the free acid did not rise above 5. The red cells of the blood numbered 4,250,000 per cubic millimetre, the hæmoglobin value was 74.9%, the colour index was 0.88, and the leucocytes numbered 8,160 per cubic millimetre.

DR. E. H. STOKES showed a woman, aged forty-three years, who was first seen at the out-patient department on November 19, 1931.

She complained of the following symptoms: (a) pains in the fingers, wrists, shoulders, knees and ankles, both at rest and on movement, during the previous three months; (b) swelling of the feet in the morning; (c) loss of two stone in weight during the previous three months; (d) dyspnoea on moderate exertion; (e) menstrual irregularity.

Physical examination revealed fusiform swelling of the fingers with limitation of flexion. Palpable grating was present on movement of the knees, and periarticular swelling was evident round the ankles. The blood count showed a leucocytosis of 15,960, the polymorphonuclear cells being 74%. The test meal showed achlorhydria.

From 1931 to 1935 the patient was treated by various methods, iodides, colchicum, thyroid substance, streptococcal vaccine and barbiturates being administered. A

bilateral radical antrum operation had been performed. Physio-therapeutic measures, such as hot air and massage, were also employed, but very little improvement was noted.

On August 29, 1935, a course of injections of "Solganal B Oleosum" was instituted. In 1936 a further course of "Solganal" was given. Each course consisted of two grammes of "Solganal B Oleosum". After the first course the patient, who was suffering from seborrhœa, developed an extensive dermatitis. While she was receiving the second course of injections, "Tabloid Calcium Gluconate" was ordered to be taken twice a day in doses of 1.2 grammes (20 grains). Dermatitis did not recur with the second course of injections. Although the joints were not quite normal, there had been considerable improvement after two courses of "Solganal B Oleosum". The third course was in progress at the time of demonstration.

#### Disseminated Sclerosis.

Dr. Stokes next showed a man, aged twenty-nine years, who was first seen at the out-patient department on July 30, 1936. He complained of the following symptoms: (a) Attacks of double vision during the past six months. (b) Weakness in the left thigh. This symptom had first occurred a year previously, and after a short time disappeared. About one week previously, however, he complained of weakness in both thighs and legs. (c) Giddiness, especially on walking. (d) Hyperæsthesia of the sole of the left foot. (e) Difficulty in commencing micturition.

On physical examination the following phenomena were noted: unsteady gait, well-marked Rombergism, slightly impaired tactile sensation in the legs, intention tremor, very exaggerated knee jerks, bilateral extensor plantar responses, absence of the right abdominal reflex, and pallor of the temporal sides of both optic disks.

The blood count gave a normal result. The blood serum and cerebro-spinal fluid failed to react to the Wassermann test.

The patient received a series of injections of silver "Silvarsan" at weekly intervals. The following doses were given: 0.05, 0.1, 0.15, 0.2, 0.3, 0.3, 0.4 gramme. Following the first two injections there was considerable improvement in the patient's gait. Dr. Stokes said that unfortunately the patient, at the time of demonstration, was in the same condition as on July 30, 1936.

#### Artificial Pneumothorax Therapy for Pulmonary Tuberculosis.

To illustrate the result of artificial pneumothorax therapy for pulmonary tuberculosis, Dr. Stokes showed a woman, aged twenty years. She was first seen at the out-patient department on December 15, 1932. She had been shown at previous clinical meetings of the Branch held at Sydney Hospital.

When artificial pneumothorax therapy was first instituted early in 1933, she was suffering from pulmonary tuberculosis affecting the upper and middle lobes of the right lung. Hydropneumothorax developed in July, 1933. On April 30, 1934, the right side of the chest was explored and yellow fluid was removed. On June 7, 1934, air replacement was performed after removal of two pints of fluid. The patient's general health had improved in 1935, and on February 21, 1935, an X ray examination of the chest showed "partial right-sided pneumothorax with well-marked adhesions displacing the mediastinum to the right".

Dr. Stokes pointed out that the right side of the chest was collapsed and that the heart was displaced to the right. An electrocardiogram taken early in October, 1936, showed left ventricular preponderance. No tubercle bacilli had been found in a recent examination of the sputum. The degree of collapse attained in this case was assisted by the absence of a rigid chest wall found in older individuals.

#### Neoplasm of the Pleura.

Dr. Stokes showed a specimen taken *post mortem* from a patient who had been shown at previous meetings of the Branch at Sydney Hospital. It had been thought that he was suffering from endothelioma of the pleura. He had

improved considerably with deep X ray therapy, but he died from an intercurrent attack of pneumonia. Autopsy revealed a large growth arising from the visceral pleura of the lower lobe of the right lung. Histological examination showed the growth to be a fibrosarcoma.

#### Lead Poisoning Associated with Severe Anæmia.

Dr. Stokes also showed a man, aged thirty years, who in 1933 had been employed for a period of three months as a battery worker. He had suffered from lead poisoning, which was associated with a severe degree of anæmia. His chief symptoms were attacks of abdominal pain, vomiting, constipation and weakness.

On physical examination there was evidence of a blue line on the gums. Pallor was pronounced. A blood count, made early in October, showed that the red blood cells numbered 3,640,000 per cubic millimetre. Punctate basophilia was present and a number of normoblasts were seen. The lead content of the urine was 0.05 milligramme in the twenty-four hour specimen.

After three weeks' treatment by means of a low calcium diet and hypodermic injections of "Parathormone" (Lilly) (ten units twice a day for the first week, increasing to twenty units twice a day during the last fortnight), his general condition had shown considerable improvement and the output of lead in the urine had increased to 0.1 milligramme in the twenty-four hour specimen. During this process of deleading there had been no return of abdominal colic. Iron and ammonium citrate in doses of two grammes (thirty grains) three times a day had been administered for some time past.

#### Carcinoma of the Œsophagus.

Dr. Stokes's last patient was a man, aged fifty-three years. He was first seen on September 14, 1936, when he complained of pain in the lower part of his chest (behind the sternum, at the level of the sixth rib); the pain had been present for a period of nine weeks. He found it difficult to swallow solid food, and had lost sixteen pounds in weight during the past nine weeks.

Physical examination revealed a moderate degree of wasting. An examination of the œsophagus with X rays after ingestion of barium revealed an irregularity of the lower end of the œsophagus suggestive of carcinoma. Œsophagoscopy had been performed on three occasions with negative results. The difficulty in swallowing still persisted, but there had been very little further loss of weight. It was proposed to make another X ray examination of the œsophagus in a fortnight's time, as, although the symptoms might be due to œsophagismus, carcinoma could not be excluded.

#### Hydatid Disease of Lung and Liver.

Dr. GEORGE BELL showed a man, aged thirty-seven years, a labourer, who had been born in Sydney. At the time of his admission to hospital he complained of: (a) loss of weight—eighteen pounds in five weeks; (b) vomiting, which usually occurred at night, and which relieved pain; (c) the pain, which was relieved by vomiting. The pain was present in the right lumbar region; it passed round to the epigastric region, was worse at night, and had been getting steadily worse for five weeks.

Physical examination revealed tenderness in the right side of the abdomen. The liver was palpable two and a half inches below the right costal margin.

Dr. Bell summarized the main points in the clinical history as follows.

On September 26, 1935, the patient was having bouts of gall-bladder colic.

On October 1, 1935, he complained of pain in the right shoulder.

On October 13, 1935, he had a fit of coughing accompanied by pain in the chest and followed by a rise of pulse rate and temperature.

On October 14, 1935, X ray examination revealed the presence of fluid in the right side of the chest. At operation four pints of fluid were removed from the pleural cavity under negative pressure.

On October 31, 1935, X ray examination showed that a collapsed hydatid cyst was present.

On November 22, 1935, a bronchial fistula was present.

On December 3, 1935, transpleural hepatotomy was performed and an hepatic hydatid cyst was drained.

On January 31, 1936, the patient began to do exercises with Wolff's bottles.

On February 29, 1936, the patient was discharged from hospital, and on May 2, 1936, the lung had completely expanded.

Dr. Bell said that several special tests had been carried out. A leucocytosis was present, but no eosinophilia was found. No hydatid hooklets or ectocyst fragments were found in the faeces or sputum. Both the Wassermann and the Kahn tests failed to yield a reaction. No reaction was obtained with either the Casoni test or the complement deviation test for hydatid disease.

#### Intracranial Tumour.

Dr. Bell showed a male patient, aged thirty years, who had been shown by him at a clinical meeting at Sydney Hospital in July, 1928. This patient had had a *spongioblastoma multiforme* removed in December, 1927. The history of this patient was recorded by Dr. Bell, with a pathological report by Dr. Oliver Latham, in THE MEDICAL JOURNAL OF AUSTRALIA of December 15, 1928. Dr. Bell presented the patient to show that he was in good health and was able to earn his own living.

#### Central Dislocation of the Hip.

Dr. ARCHIE ASPINALL showed a woman, aged sixty years, who had been injured in a motor-car accident on September 19, 1936. The patient was sitting in the front seat when the accident occurred. At an X ray examination made on October 1, 1936, it was found that the femur had passed through the acetabulum, carrying the posterior wall and portion of the ischium with it into the pelvis. The ischium was fractured at the anterior ramus. When the fracture was reduced, a roller towel was placed round the upper part of the thigh and traction was exerted outwards while the limb was adducted; the result was controlled by a finger inserted into the rectum. Schmerz's hooks were inserted into the femur above the condyles and the limb was put up with traction on a Balkan frame in adduction. At the same time traction was maintained in an outward direction at the upper part of the thigh by means of a broad rubber band placed round the thigh with pulley date.

Dr. Aspinall, in discussing the case, quoted some extracts from "Keen's Surgery". Here it was stated that in central dislocations the head of the femur was forced into the pelvis. The limb at the same time was rotated outwards. The deformity could be reduced, but gradually recurred. There was a decrease in the distance between the anterior iliac spine and the trochanter. The head could be felt through the rectum. Reduction was best effected by traction in an outward and downward direction in the axis of the femoral neck, in order to pull the head of the femur out of the pelvis. No great force should be employed during this manipulation. If the head had penetrated too far into the pelvis, arthrotomy was indicated. The limb should be kept in a Buck's extension for six weeks.

Dr. Aspinall pointed out that at the time of the meeting X ray examination showed that the fragments were in a "good serviceable position".

#### Repair of Severed Tendons.

Dr. Aspinall showed a man who had had the flexor tendons of the forearm, together with the median and ulnar nerves, severed twenty-eight years previously by putting his hand through a glass window. Dr. Aspinall had undertaken the suturing of the severed structures. The man was working without disability as a wharf-labourer. Dr. Aspinall showed the patient to demonstrate that it was possible to obtain a good result by suturing even after so long a period of time had elapsed.

#### Orthopaedic Conditions.

Dr. J. R. HOETS and Dr. R. V. GRAHAM showed patients to demonstrate orthopaedic conditions and their treatment.

A woman, aged fifty-three years, who had suffered for years from pain in the right shoulder, had a condition that was diagnosed on X ray examination as being calcification of a subdeltoid bursa.

A man, aged twenty-three years, who had injured his arm in a tram smash, had a lower motor neurone paralysis of the biceps, deltoid, brachialis and brachioradialis muscles. X ray examination revealed the presence of a rudimentary cervical rib.

A woman, aged forty-nine years, had had a fracture of the femoral neck treated by the Smith-Petersen nail method.

A woman, aged twenty-four years, who suffered from an adduction deformity at the hip joint, was treated by tenotomy of the adductors and osteotomy.

A woman, aged thirty-one years, who gave a history of having lived on bore water for twenty-one years, manifested the condition known as marble bones.

A woman, thirty-six years of age, who was suffering from tuberculosis of the spine, had been treated by a fusion operation. There were no signs of activity of the disease and good fusion had been obtained.

A man, aged fifty-three years, who gave a history of having suffered for eighteen months from pain in the left shoulder, was found on X ray examination to have calcification of a subacromial bursa.

#### Microscopic Demonstration of Gynaecological Conditions.

Dr. R. I. FURBER demonstrated by means of a projector microscopic slides. Those shown included a granulosa cell tumour of the ovary with extreme cystic changes in the corresponding endometrium, a Krukenberg tumour, various ovarian carcinomata, leucoplakia of the vulva, urethral polypi and menstrual changes in the endometrium.

#### Urological Conditions.

Dr. REGINALD BRIDGE and Dr. KEITH KIRKLAND, from the Department of Urology, showed a patient and some specimens and instruments.

A man, forty years of age, who had a life-long incontinence of urine, had suffered from complete epispadias. The condition was cured by Young's operation. This case will be reported in detail, with illustrations, at a later date.

A number of pathological specimens were shown illustrating: (a) various types of newgrowth of the kidney and bladder, (b) tuberculosis of the urinary tract, (c) calculus formation. With these were shown a series of skiagrams illustrating the importance of pyelography and other urological methods in diagnosis.

The "Braasch-Bumpus" resectoscope was shown, and the technique of its use was demonstrated on *post mortem* specimens. The opinion was expressed that this instrument was the best of its type.

An instrument devised by Dr. Clifford Morson for illuminating the prostatic cavity (after removal of the prostate gland) was also shown and its technique was explained. This instrument had been found of great use.

#### Thoracoplasty for Pulmonary Tuberculosis.

Dr. M. P. SUSMAN showed three patients who had had thoracoplasty for pulmonary tuberculosis.

The first patient, L.D., had cavitation in the upper zone of the right lung; the left lung and the rest of the right lung were healthy. Artificial pneumothorax had failed to cause adequate collapse of the diseased area and it had been supplemented with some benefit by phrenic paralysis. A tuberculous pleural effusion developed, which had disappeared soon after the injection into the pleural cavity of two cubic centimetres of a saturated alcoholic solution of methylene blue. Although this ultimate result was satisfactory, the immediate result of the injection had been alarming, as the patient collapsed and for a short time appeared to be at the point of death. In spite of the

pneumothorax and the phrenic paralysis she continued to bring up daily about half an ounce of sputum containing tubercle bacilli, so an upper three-rib thoracoplasty was done. This had resulted in good collapse of the diseased area and the disappearance of the cavities; her general condition was improving and there was no sputum. She was now consolidating the arrest of the disease in a sanatorium.

The second patient, P.P., aged thirty-eight years, had unilateral fibro-cavernous phthisis with persistent cough and sputum containing tubercle bacilli. Several years ago he was ill and febrile and was treated by artificial pneumothorax, which eventually had to be abandoned because of adhesive pleuritis; at this time the phrenic nerve was paralysed. Thoracoplasty was advised because he had positive sputum and persisting cavities with fibrosis. Total thoracoplasty (ribs 1 to 10) was done in two stages, a start being made from above. Good collapse of the diseased lung was obtained, the sputum was decreasing and was free of Koch's bacilli.

Dr. Susman's third patient, R.A., aged thirty years, also had a unilateral fibro-cavernous tuberculosis of several years' duration, with an appreciable amount of sputum containing tubercle bacilli. He could be described as a "good chronic". He had had a complete thoracoplasty done in four stages, supplemented by phrenic paralysis; at the time of the meeting he had only a trace of sputum, and radiograms showed very good collapse of the whole of the diseased lung. He was wearing a special thoracoplasty belt to compress and support the deribbed hemithorax.

#### Colorimetric Apparatus.

Dr. H. S. HALCHRO WARDLAW showed an illuminating device for use in colorimetric determinations. He illustrated the use of the apparatus in connexion with a colorimetric method for the estimation of protein based on the biuret reaction. He also showed bicolour standards and comparator for the colorimetric determination of pH in coloured liquids, and a colour standard for the control of the pH of urine in mandelic acid therapy.

#### Spinal Analgesia.

Dr. S. V. MARSHALL demonstrated certain experimental aspects of spinal analgesia, according to the technique originated by Dr. W. Etherington Wilson, of Torquay, England, by whose courtesy permission was obtained for their reproduction. Artificial spinal canals of glass were used, these being of such configuration and capacity as to conform closely to the natural structure. While admitting that they could not reproduce all the factors involved in spinal analgesia, Dr. Marshall said that valuable information might be gained from them, particularly in reference to density, temperature, diffusion *et cetera*. On the basis of similar experiments Wilson had evolved his modification of the Howard Jones technique, and his upright posture for injection was now used extensively abroad.

Solutions of varying specific gravity were injected into the canals, which contained an artificial cerebro-spinal fluid with a specific gravity of 1007. Light solutions rose and heavy solutions fell, and when injected concurrently they remained relatively unmixed, even when the position of the tube was reversed repeatedly. The effects of expansion and barbotage were shown with heavy solutions, and with both heavy and light solutions the extreme importance of posture was demonstrated. Using Wilson's upright technique, Dr. Marshall showed a paradox of posture: light solutions ascended more slowly in the vertical than in the inclined position, introducing possibilities of controllability that were borne out clinically. The fact that large quantities of light solutions injected at room temperature into cerebro-spinal fluid at body heat remained immobile until warmed was well demonstrated, this emphasizing the importance of warming solutions, syringes *et cetera* if constant results were to be obtained in practice.

#### Skiagrams.

Dr. D. G. MAITLAND showed a comprehensive series of X ray lantern slides, amongst which were demonstrated: (a) cases illustrative of the various types and degrees of

pulmonary tuberculosis; (b) interesting gall-bladder cases, demonstrating cholelithiasis and the borderline cases in which adequate function was apparently present, yet small calculi had been demonstrated on contraction of the organ after a fatty meal, or subsequently at operation; (c) bone tumours and tumours of the skull involving the pituitary fossa.

A MEETING of the Victorian Branch of the British Medical Association was held at Saint Vincent's Hospital, Melbourne, on November 18, 1936. The meeting took the form of a series of clinical demonstrations by members of the honorary staff.

#### Obliterative Arterial Disease of the Limbs.

Dr. T. A. F. HEALE showed two patients with *thrombo-angiitis obliterans* to illustrate the methods of examination and the pitfalls in diagnosis of obliterative arterial disease affecting the limbs.

One patient, a male, aged thirty-seven years, had noticed a pain in the right foot when walking three and a half years before the meeting, and three months later had consulted a doctor because of a pain in the right great toe; the pain was attributed to an ingrowing toe-nail, and portion of the nail was removed. Ulceration and gangrene of the toe followed the operation, and finally the toe was amputated at the metatarso-phalangeal joint and the wound had healed very slowly.

Dr. Heale said that the patient had next noticed a pain in the left foot while walking two and a half years before the meeting. Nine months after the pain commenced in the left foot the patient dropped on to the left great toe a weight which broke the skin; infection started and gangrene of the toe occurred; several months later the left great toe was amputated at the metatarso-phalangeal joint and again the wound healed very slowly.

The patient was next seen one year before the meeting with a small ulcer at the tip of the index finger of the right hand, and eight months later a small ulcer also developed at the tip of the left thumb. The patient had been a heavy smoker for years, but there were no other relevant facts in his past history. Dr. Heale said that on examination the skin of both feet had appeared well nourished, although the feet were a little colder than normal; the great toe on each foot had been amputated and the wounds had healed well. No pulsations could be felt in the *dorsalis pedis* or posterior tibial arteries in either limb. The right and left popliteal and femoral arteries pulsated well; when the feet were elevated at an angle of 45° for several minutes they became excessively pale; return of colour in the feet was abnormally slow in the dependent position, and finally well marked rugor developed. The fingers of the right hand were colder than normal and at the tip of the index finger there was a small depressed scar. The brachial and ulnar arteries pulsated normally, but there was no pulsation in the radial artery at the wrist.

Dr. Heale said that Allen's test had demonstrated that the circulation to the right hand was entirely via the ulnar artery. If the ulnar artery was obliterated by pressure of the fingers for a few minutes and then the pressure was released, the return of colour was rapid in the palm, but much slower in the fingers, especially the index finger. Dr. Heale said that the fingers of the left hand were also colder than normal, and there was a small ulcer at the tip of the thumb; pulsations in the brachial and radial arteries were normal, but there were no pulsations in the ulnar artery at the wrist, and Allen's test had shown that the circulation to the left hand was entirely via the radial artery. The return of colour to the left hand after release of the pressure on the radial artery was rapid in the palm and slower in the fingers, especially in the distal portion of the thumb.

Dr. Heale said that general examination of the patient revealed no other abnormality. The systolic blood pressure was 140 millimetres of mercury and the diastolic pressure 70 millimetres; the Wassermann test yielded no reaction.

Another patient shown by Dr. Heale was a male, aged forty-two years. Seven years before the meeting the

patient had complained of pain in the feet, which had been attributed to "fallen arches"; shortly afterwards the patient dropped a brick on the fifth toe of the right foot, breaking the skin; infection, ulceration and gangrene followed, and finally the toe was amputated. The wound took ten months to heal. Two years later an infection occurred under a corn on the right great toe; osteomyelitis of the terminal phalanx occurred and the toe was amputated; the healing was slow. For three years previous to the meeting ulceration and gangrene had involved the second, third and fourth toes of the right foot, varying portions of which had sloughed off. Dr. Heale said that in March, 1936, the ulceration had spread on the dorsum of the foot almost to the ankle, and on the plantar aspect of the foot for a distance of one and a half inches. There had never been any symptoms in the hands. The patient had always been a heavy smoker, but there was no other relevant fact in his past history. Intensive treatment for the six months previous to the meeting had improved the condition of the foot, and at present there were only two small areas of ulceration present, each about the size of a shilling. Dr. Heale said that there were no pulsations present in the right *dorsalis pedis* or posterior tibial arteries; the popliteal and femoral arteries pulsed well. Abnormal postural changes were well defined; in the left leg no trophic changes had taken place. No pulsations could be detected in the *dorsalis pedis* or posterior tibial arteries, but the popliteal and femoral arteries pulsed well. The postural colour changes were abnormal, but there was no evidence of involvement of the upper limbs. Dr. Heale said that general examination revealed no abnormality and the serum failed to yield the Wassermann reaction.

Dr. Heale said that he had shown these two patients because the initial symptom in each case had been pain in the foot, the significance of which was not appreciated. Pain in a limb frequently brought a patient to consult a doctor; it should be remembered that one of the possible causes of the pain was obliterative arterial disease, and it was of the utmost importance to recognize pain so arising. Dr. Heale then described the types of pain which occurred in obliterative arterial disease. He said that intermittent claudication was frequently diagnosed as rheumatism, arthritis, neuritis, fallen arches or metatarsalgia. Pain occurring while the limb was at rest was also common in obliterative arterial disease and, if localized to a toe, was often attributed to an ingrown toe-nail. The disastrous result of such a mistake was well illustrated by Dr. Heale's first patient. Another common mistake was to incise the painful red toe of obliterative disease in the belief that deep-seated inflammation was present. One should beware of the apparently "inflamed" toe that was cold to the touch. Dr. Heale said that it was, of course, evident that a patient with obliterative arterial disease might have an ingrown toe-nail, painful corn or infection of the toe; but, regardless of how apparent the cause might be, no local operation should be done until it was certain that the arterial blood supply was adequate.

Dr. Heale also demonstrated a number of simple diagnostic tests for obliterative arterial disease, and discussed the treatment.

#### Vascular Conditions.

Dr. C. H. FITTS showed two cases of different types of arterio-venous anastomosis, and contrasted them with another case in which free aortic incompetence was present. He said that it had been pointed out by Lewis that in arterio-venous aneurysm many of the phenomena regarded as special associations with aortic incompetence might also develop. These were: enlargement of the heart, which had been present in both cases presented; "water-hammer" pulse; throbbing carotid arteries; intense capillary pulsation; high brachial pulse pressure; low diastolic readings; a systolic blood pressure that was higher in the popliteal than in the brachial artery; high pulse rate. In the two cases presented these phenomena had not developed, but further observation might elicit them.

Dr. Fitts showed a child, aged six years, that presented the signs of patent *ductus arteriosus*. Dr. Fitts said that

comment had first been made about the child's heart when the child was two years of age; the child had never been distressed, although she was active; no cyanosis had ever been noticed, and there was no clubbing of the fingers. The child was well developed for her age. On examination a thrill was palpable over the precordium; it was of maximum intensity in the second left intercostal space. This was continuous, but systolic intensification was present; a continuous harsh murmur was heard over the same area. On radiological examination pulsation was evident in the pulmonary artery, and the latter had shown prominently in the film taken after screening. The child was leading a normal life, but came up for routine examination every three months. It was thought that the magnitude of the physical signs belied the extent of the underlying lesion. Dr. Fitts said that the louder the murmur was up to a point, the narrower was the patency; further, the pulmonary artery shadow was not so large in the film as in many other cases.

Another patient shown by Dr. Fitts was a male, an ex-pugilist, fifty-three years of age, who was suffering from an arterio-venous aneurysm in the left supra-clavicular region. Eighteen years previous to the meeting there had appeared in that region a painful swelling following a punch that the patient had received; the pain had subsided in a few days, but the swelling persisted, and, after enlarging for some time, had remained stationary during the period of observation, which had lasted for two years. Dr. Fitts said that there was a continuous thrill over the site of the swelling, with systolic intensification and a humming-top murmur. The systolic blood pressure was 120 and the diastolic pressure 60 millimetres of mercury in both arms; the heart was somewhat enlarged, but none of the other phenomena mentioned were present.

The patient shown by Dr. Fitts to contrast with these two patients presented multiple valve lesions due to rheumatic heart disease. Dr. Fitts said that the predominant lesion was a free aortic incompetence, but there was also a harsh systolic murmur at the aortic area with an associated thrill, which was easily palpable. It had been suggested that it was of little importance whether this led to the diagnosis of aortic stenosis or not; but that the value of the signs lay in the fact that they occurred rarely in any other condition than rheumatic heart disease. Dr. Fitts said that they were particularly rare in syphilitic aortitis, a condition in which aortic stenosis never occurred. Dr. Fitts considered that stenosis of the aortic valve was present; the fact that free incompetence was present did not detract from this possibility. While the patient was under observation a presystolic murmur had also been heard at times at the mitral area. Dr. Fitts also demonstrated a film of the patient's chest showing the enlarged dense left auricle easily visible in the straight film and occupying the middle portion of the right heart border. Dr. Fitts said that this was never found in any other condition but mitral stenosis.

Another patient shown by Dr. Fitts was a male, eighty-one years of age, suffering from rheumatic heart disease and mitral stenosis. His systolic blood pressure was 220 and his diastolic pressure 160 millimetres of mercury; the rhythm of the heart was normal. The patient was still in active work as a basket-maker; his family had carried on this craft for four generations; the patient had emigrated at the age of twenty-nine years. He had emigrated on the advice of Sir Henry Acland on account of recurrent attacks of rheumatism and because his heart had been affected. The patient gave a vivid account of going to the Brompton and Saint Thomas's Hospitals for demonstration purposes. He said that Sir Henry Acland would ask him to run round the room and then to lie on his left side so that he could demonstrate the murmurs at the mitral area, which the students had been unable to hear. There was circumstantial evidence that the mitral stenosis had been present for at least sixty years. Dr. Fitts said that the hypertension was of high degree; he demonstrated again the frequent associations of these two conditions and pointed out that the course followed by such patients might be benign.

**Addisonian (Pernicious) Anæmia.**

Dr. T. E. Lowe demonstrated a patient with Addisonian (pernicious) anæmia who was under treatment with liver extract given by intramuscular injection. The patient's anæmia had been satisfactorily controlled by eight cubic centimetres of "Campolon" a month. Dr. Lowe showed tables illustrating the history of Addisonian anæmia from Addison's original description to the present day. Addison described all the symptoms with the exception of the gastro-intestinal, attention to which had been drawn by Fenwick (1880). Whipple (1925) had demonstrated that dogs which were being bled recovered more quickly when fed on diets high in liver than those fed otherwise. Minot (1926) applied these results to the treatment of human anæmias, and the liver treatment of Addisonian anæmia came into being. Castle (1929) had shown by experiments that there were factors both in the food and in the stomach secretions which were concerned in the development of the blood cells. Meulengracht (1935) showed that the stomach factor was probably secreted by the cardiac, pyloric and Brunner's glands.

Dr. Lowe also showed graphs illustrating various methods of administering liver to these patients. Particular reference was made to the parenteral administration of large doses of liver extracts at the onset, to obtain an early and maximum response to the therapeutic agent, and to the success of the use of moderate doses at intervals of several weeks. Reference was also made to the need for the use of iron in some cases of Addisonian anæmia in addition to the liver. Dr. Lowe said that in severe cases the intravenous use of extract suitably prepared might avert the necessity of a blood transfusion.

(To be continued.)

**NOMINATIONS AND ELECTIONS.**

THE undermentioned have applied for election as members of the New South Wales Branch of the British Medical Association:

- Leggett, Clarence Arthur Campbell, M.B., B.S., 1937 (Univ. Sydney), Royal Prince Alfred Hospital, Camperdown.  
 Cooley, Geoffrey Glover, M.B., B.S., 1937 (Univ. Sydney), Sydney Hospital, Sydney.  
 Finigan, Frank O'Donnell, M.B., 1936 (Univ. Sydney), District Hospital, Marrickville.  
 Maynard, Stanley Clive, M.B., B.S., 1935 (Univ. Sydney), Molong.  
 Middleton, Geoffrey Campbell, M.B., B.S., 1937 (Univ. Sydney), 36, Finlayson Street, Lane Cove.  
 Benson, Henry Gordon, M.B., B.S., 1936 (Univ. Sydney), Royal Prince Alfred Hospital, Camperdown.

THE undermentioned have been elected members of the Victorian Branch of the British Medical Association:

- Little, George Gordon, M.B., B.S., 1934 (Univ. Melbourne), 4, Station Street, Ivanhoe, N.21.  
 Lord, Frank Haighton, M.B., B.S., 1935 (Univ. Melbourne), Mooroopna Hospital, Mooroopna.

**Medical Societies.****THE MEDICAL SCIENCES CLUB OF SOUTH AUSTRALIA.**

A MEETING of the Medical Sciences Club of South Australia was held at the University of Adelaide on September 4, 1936.

Dr. K. S. Hetzel gave an account of experiments carried out at Harvard by himself and Dr. H. W. Fullerton, with absorption of iron.

At first experiments were planned to study the effect of varying pH on the passage of iron salts through the "Cellophane" membrane. Minced beef was digested either with commercial pepsin and hydrochloric acid or with gastric juice from normal people, or gastric juice obtained from the administration of histamine to achlorhydria. Iron and ammonium citrate were added to the mixture, and dialysis in a "Cellophane" sac was carried out.

It was found that a quantity of iron which diffused through the membrane was at a minimum when the dialysate was at low acidity, but increased up to around 50% of the added iron when the pH was made acid.

Following this, attention was turned to the human subject and estimations of the pH in the stomach, duodenum and upper part of the jejunum were made in achlorhydria and healthy controls. Samples were obtained by means of a duodenal tube, the position of the tip of which was located by fluoroscopy.

It was found in normals that the reaction of the duodenum and jejunum was always acid, and with the passage of food became temporarily decidedly acid. In the achlorhydria, on the other hand, whilst the contents were a little acid, they never had temporary periods of relatively high acidity. Dr. Hetzel pointed out that whilst this work was not conclusive, it threw light on one probable factor in the causation of hypochromic anæmia in achlorhydria.

**Correspondence.****"THE OVA OF ASCARIS MEGALOCEPHALA."**

SIR: I have recently had my attention called to a publication entitled "The Ova of Ascaris Megaloccephala", by Charles E. Allen, D.D.Sc., which contains, among other things, a rather striking photomicrograph as its frontispiece. The photomicrograph depicts a "human ovarian ovum" with a clearly defined nucleus in which the deeply stained chromosomes are visible. This appearance is described in the legend as "nucleus, with so-called nucleoli—germinal spots. These are actually spermatozoa . . . . More than twelve spermatozoa can be counted in the centre of the huge ovum. One with the tail-piece still intact, others with the tail-piece partially absorbed, disposing of the fallacy that one spermatozoa alone 'fertilized' the human ovum."

Apart from the fact that the figure depicts an ovarian ovum, which is naturally not a fertilized ovum, is the peculiar error of interpreting a normal chromosome picture as being twelve spermatozoa congregated in the nucleus. This note is not written merely for the sake of calling attention to a very ridiculous error, but rather because the legend states that the slide was "prepared in the Medical School, University of Melbourne". Beyond the fact that the photomicrograph is taken from one of the routine teaching slides (of the ovary of a cat) prepared in this department, the Anatomy School of Melbourne University is in no way associated with this work.

Yours, etc.,

F. WOOD JONES.

School of Anatomy,  
University of Melbourne,  
April 1, 1937.

**Obituary.****HAROLD CRANWELL HAYNES.**

WE regret to announce the death of Dr. Harold Cranwell Haynes, which occurred on March 23, 1937, at Balwyn, Victoria.

## JAMES LANDELLS BLAKIE.

WE regret to announce the death of Dr. James Landells Blakie, which occurred on April 2, 1937, at Hawthorn, Victoria.

## ROBERT GILLESPIE SCOTT.

WE regret to announce the death of Dr. Robert Gillespie Scott, which occurred on April 2, 1937, at Sandy Bay, Tasmania.

## JOHN EDWARD FORMBY.

WE regret to announce the death of Dr. John Edward Formby, which occurred on April 5, 1937, at Adelaide, South Australia.

## Books Received.

VADE MECUM OF MEDICAL TREATMENT, by W. G. Sears, M.D., M.R.C.P.; 1937. London: Edward Arnold and Company. Crown 8vo, pp. 373. Price: 10s. 6d. net.

AN INTRODUCTION TO MEDICAL SCIENCE, by William Boyd, M.D., M.R.C.P., F.R.C.P., F.R.S.; 1937. Philadelphia: Lea and Febiger. Medium 8vo, pp. 307, with 108 engravings. Price: \$3.50 net.

DIAGNOSIS AND NON-OPERATIVE TREATMENT OF THE DISEASES OF THE COLON AND RECTUM, by G. Schwarz, M.D., J. Goldberger, M.D., and C. Crocker, M.D.; 1937. London: H. K. Lewis and Company Limited. Demy 8vo, pp. 552, with 246 illustrations and 9 coloured plates. Price: 40s. net.

## Diary for the Month.

- APR. 13.—New South Wales Branch, B.M.A.: Executive and Finance Committee.  
 APR. 20.—New South Wales Branch, B.M.A.: Ethics Committee.  
 APR. 21.—Western Australian Branch, B.M.A.: Branch.  
 APR. 21.—New South Wales Branch, B.M.A.: Clinical Meeting.  
 APR. 23.—Queensland Branch, B.M.A.: Council.  
 APR. 27.—New South Wales Branch, B.M.A.: Medical Politics Committee.  
 APR. 28.—Victorian Branch, B.M.A.: Council.  
 APR. 29.—New South Wales Branch, B.M.A.: Branch.  
 APR. 29.—South Australian Branch, B.M.A.: Branch.  
 MAY 4.—New South Wales Branch, B.M.A.: Organization and Science Committee.  
 MAY 5.—Victorian Branch, B.M.A.: Branch.  
 MAY 5.—Western Australian Branch, B.M.A.: Council.  
 MAY 6.—South Australian Branch, B.M.A.: Council.  
 MAY 7.—Queensland Branch, B.M.A.: Branch.  
 MAY 11.—New South Wales Branch, B.M.A.: Executive and Finance Committee.

## Medical Appointments Vacant, etc.

For announcements of medical appointments vacant, assistants, locum tenentes sought, etc., see "Advertiser", pages xi to xii.

CLEVE HOSPITAL BOARD, CLEVE, SOUTH AUSTRALIA: Medical Practitioner.

PUBLIC SERVICE BOARD, ADELAIDE, SOUTH AUSTRALIA: Registrar.

SYDNEY HOSPITAL, SYDNEY, NEW SOUTH WALES: Honorary Officers.

TOOWOOMBA HOSPITALS BOARD, TOOWOOMBA, QUEENSLAND: Resident Medical Officer.

THE WOMEN'S HOSPITAL, CROWN STREET, SYDNEY, NEW SOUTH WALES: Honorary Officers.

## Medical Appointments: Important Notice.

MEDICAL PRACTITIONERS are requested not to apply for any appointment referred to in the following table without having first communicated with the Honorary Secretary of the Branch named in the first column, or with the Medical Secretary of the British Medical Association, Tavistock Square, London, W.C.1.

BRANCHES.	APPOINTMENTS.
NEW SOUTH WALES: Honorary Secretary, 135, Macquarie Street, Sydney.	Australian Natives' Association. Ashfield and District United Friendly Societies' Dispensary. Balmain United Friendly Societies' Dispensary. Friendly Society Lodges at Casino. Leichhardt and Petersham United Friendly Societies' Dispensary. Manchester Unity Medical and Dispensing Institute, Oxford Street, Sydney. North Sydney Friendly Societies' Dispensary Limited. People's Prudential Assurance Company Limited. Phoenix Mutual Provident Society.
VICTORIAN: Honorary Secretary, Medical Society Hall, East Melbourne.	All Institutes or Medical Dispensaries. Australian Prudential Association, Proprietary, Limited. Mutual National Provident Club. National Provident Association. Hospital or other appointments outside Victoria.
QUEENSLAND: Honorary Secretary, B.M.A. House, 225, Wickham Terrace, Brisbane, B.17.	Brisbane Associate Friendly Societies' Medical Institute. Proserpine District Hospital. Members accepting LODGE appointments and those desiring to accept appointments to any COUNTRY Hospital are advised, in their own interests, to submit a copy of their Agreement to the Council before signing.
SOUTH AUSTRALIAN: Secretary, 178, North Terrace, Adelaide.	All Lodge appointments in South Australia. All contract Practice Appointments in South Australia.
WESTERN AUSTRALIAN: Honorary Secretary, 205, Saint George's Terrace, Perth.	All Contract Practice Appointments in Western Australia.

## Editorial Notices.

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